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Men,

Arithmetick VULGAR AND DECIMAL;

Fully Explained and Directed, after a plain and eaſie Method to the meaneſt Capacity:

BY

Mr. THOMAS BRUCE Schoolmaſter in *Edinburgh*.

K

The firſt EDITION, carefully corrected.

EDINBURGH,
Printed by *Charles Dallas*, MDCCXXIV.

BRITISH MUSEUM

EPISTLE Dedicatory.

To the much Honoured, The Governors of the Merchant *Maiden-Hoſpital of Edinburgh.*

Gentlemen,

I *Beg Leave to ſend this ſmall Performance of mine abroad into the World, under your Protection. It is deſigned for the Inſtruction of Youth: And the tender (I may ſay fatherly) Care you take of thoſe young Perſons in your Hoſpital, whom you furniſh, not only with a comfortable Maintenance, but a ſuitable Education in all things proper to their Age and Sex, challenges me (who have alſo received particular Favours from you) to lay this ſmall Eſſay on the Science of* Arithmetick, *at your Feet. I am,*

Gentlemen,

Your moſt Humble and
Obliged Servant,
THO. BRUCE.

Epiſtle Gratulatory TO THE *Gentlemen Subſcribers.*

Gentlemen,

I *Hereby take the Opportunity of returning you my hearty Thanks, for your Aſſiſtance given me, in publiſhing this my ſmall Work and Labour of* Arithmetick; *Hoping you ſhall ſuſtain no Loſs thereby, but lay undeniable Ties upon him (in all Gratitude) to remain for Life,*

Tour very Humble,

and much Obliged Servant,

THO. BRUCE.

TO
The READER.

After that ſo many ingenious Perſons have written at ſuch Length, and with ſo much Judgment and Exactneſs, on the uſeful Science of Numbers, I am not ſo vain as to think my ſelf capable to make any new Improvements on the Subject. All that I pretend to in the following Treatiſe, is, that I have, according to my Ability, treated of Arithmetick *in a more plain and familiar Way; and for the Sake of Beginners, and thoſe of a weaker Capacity, ſet ſome Things in a clearer Light, than (for what I know) has been done before. With this View I ſend this little Piece abroad, and hope, it may (on the ſame Account) meet with a favourable Reception in the World: Concluding in all Duty,*

Your very humble Servant,

THO. BRUCE.

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A ſhort Definition of ARITHMETICK.

ARITHMETICK *is that Noble* Science, *by which we are rightly led into the Method of ſearching into* Numbers *and* Proportions.

Its Numbers *are expreſſed thus,*

1. 2. 3. 4. 5. 6. 7. 8. 9. 0.

Nota, *A Cypher depending upon it ſelf is nothing in Value; but by its filling up of Places, hath Dependency upon ſome other Figure, to point, or ſpeak out its* Number *or* Value.

Its Proportions are, when we conſider the Compariſon made between Numbers of different Kinds and Places, and Numbers of greater or leſſer Value in that ſame Place and Degree, one with another. As Example, Three hundred, compared with three Tens, it is evident the one differs from the other, both in Kind and Place: Alſo compare three Tens with five Tens, it is as evident that theſe differ not in Place, but in Proportion.

Numbers *(as to their* Kinds *) conſiſt of Three Parts,* viz. Digits, Articles, *and* Mixt *or* Compound. *A* Digit *is any one of theſe above expreſt nine Figures: An* Article *is any one of theſe nine* Digits, *with a Cypher, or Cyphers annexed to them on the right Hand, as* 10, 20, 30, 400, &c. *A* mixt, *or* compound *Number is, when ſeveral* Digits *are joyned together; ſuch as,* 43, 78, 342, *or thus,* 408.

Having this far led you on in underſtanding Numbers, *and their* Proportions, *I conclude its* Definition, *in acquainting you, that this noble* Science *hath for Pillars and Supports five Rules, viz.* Notation, Addition, Subſtraction, Multiplication *and* Diviſion. *Wiſhing you all Succeſs herein, I remain, as Duty is,*

Your humble Servant,

THO: BRUCE.

VULGAR ARITHMETICK.

Definition of NOTATION.

IT is that Rule in Arithmetick, by which we attain to the true Light, Value or Notion of any given Figure, according as they bear Relation to the various Places and Degrees therein concerned, as below made plain by the Table it ſelf.

Nota, In every Degree there are always three Places of Value, *viz.* Units, Tens, and Hundreds, as is evident from the Tables, Title Page.

Notation TABLE thus.

5th Degree	15th	- -	7	Hundred of Billions.
	14th	- -	4	Ten of Billions.
	13th	- -	3	Billions (5.)
4th Degree	12th	-	8	Hund. Thouſ. of Mill.
	11th	Place. -	6	Ten Thouſ. of Millions.
	10th	-	4	Thouſ. of Millions (4.)
3d Degree	9th	-	3	Hundred of Millions.
	8th	- -	2	Ten of Millions.
	7th	- -	9	Millions (3.)
2d Degree	6th	- -	3	Hundred of Thouſands.
	5th	- -	4	Ten of Thouſands.
	4th	- -	5	Thouſands (2.)
1ſt Degree	3d	- -	4	Hundreds.
	2d	- -	7	Tens
	1ſt	- -	8	Units (1.)

Example, 942789767832523

		10
100	1000	01
001	0001	20
500	3000	02
050	0003	90
		09

Explication.

Queſt. I demand the Number, or true Value of 854? *Anſw.* 8 Hundred fifty and four Units.

Q. How read you it ſo? *Anſ.* Becauſe the 8 falls in the 3d Place, and whatever Figure it be that falls there, it muſt bear Relation to Hundreds, in whatever Degree it may happen: And the 5 is termed Fifty, becauſe it falls in the 2d Place; for every Figure falling in the Place of 2ds in any Degree, is accounted ſo many Tens in Value. And the 4 is deſigned Units, becauſe it falls in the firſt Place of that Degree, and is properly to be named the Spring or Source of the other two Places. And ſo by this we come gradually on from one Place (in Quantity of Units) to another Place thereof, till we arrive at one Quality or one higheſt Kind thereof, and ſo advance by Places and Degrees gradually from Quantity to Quality, and Quality to Quantity, according as they bear Value, or plead for Place, even ſo (as in natural Reaſon) Inferiours yield Place to Superiours,

periours, and ſo on yielding Place to one another, until they ſpring up to the higheſt Pinacle or prime Superiour.

Even ſo Units ſpring up in a natural Link, until it arrive at the Pinacle of the Quality Tens, and Tens go ſo forward, until they arrive at the Pinacle or Quality of Hundreds, *&c.*

ADDITION.

RULE II.

THis Rule of Arithmetick teacheth us to add one Quantity, or more, to another Quantity, until we out of the ſame Quantities form or make up one Quality; and ſo on we proceed (as above directed) until we come at a total Sum of the whole Quantities and Qualities, as will afterwards be explained in the following Examples.

Direction.

To work the ſame, obſerve this eaſy Method, *viz.* Add one Quantity (how many ſoever they may be, according to its Place and Relation of Degrees) to another Quantity of whatever Value, and ſo on, adding Quantities to Quantities, until you out of the ſame form one

Quality. Wherever you find the ſame Quality, put a Point there to diſtinguiſh it from Quantity, and after that, carry your Quantity that remains (after forming your Quality) to another Quantity, in order to the forming another Quality: And if it cannot be made up in the other Quantities, ſet what Quantities you have down immediately below the Quantities you are adding, carrying at the ſame Time what Qualities you have found in theſe Quantities, to the next Quantities, and ſo proceed with the reſt, as directed in this one Point, until you make a total Sum of all theſe various Quantities and Qualities, as made plain from the following Examples.

I. Example in Money.

Nota, In one Pound there are 20 Shillings, and in one Shilling 12 Pennies, and in one Penny 4 Farthings.

	l.	*s.*	*d.*	*qrs.*
Lent to *D. R.* *X*	7897	14	06	02
To the Payment of 2 Bills	4797	10	04	03
To Holland for his Uſe	1273	11	08	01
To Materials as *per* Account	2732	00	00	02
Total expended	16700	16	08	00
Ballance yet reſting is	8803	02	01	02
Proof	16700	16	08	00

Nota, You ſee in this firſt Example, the Quantities of Farthings in the Quality one

Penny, are 4. and the Quantity of Pennies in the Quality one Shilling, are 12, and the Quantity of Shillings in the Quality, one Pound *Scots* or *Sterling* are 20. And as it is with reſpect to Value in this Example, ſo in all others, according to their various Kinds or Qualities.

II. Example of Meaſure.

Nota, In one Ell there are 4 Quarters, and in one Quarter there are 4 Nails.

		Ells	*qrs.*	*nails.*
Sold to *D. F.*	*X*	732	03	02
To more 17 *June*, 1720.		478	02	03
To more, *ditto.*		784	02	02
Total ſold		1996	00	03
Ballance due by him to me		1263	01	01
Proof		1996	00	03

III. Example of Weight.

Nota, In one Stone 16 Pounds, in one Pound 16 Ounces, in one Ounce 16 Drops, in one Drop 36 Grains, the *Scots Averdupois* Weight.

	Stones	*pds.*	*ous.*	*drs.*	*grs.*
Bought from *J.D. X*	732	12	12	11	14
Item. more	278	10	08	06	16
Item. more	323	08	06	08	08
Total bought	1334	15	11	10	02
Ballance due	602	02	14	14	24
Proof	1334	15	11	10	02

IV. Example of Liquor.

Nota, In one Hogſhead there are 16 Gallons, and in one Gallon 8 Pints, and in one Pint 2 Chopins, and in one Chopin 2 Mutchkins, and in one Mutchkin 4 Gills, *Scots* Meaſure of Liquor.

		Hog.	*gal.*	*pint.*	*chop.*	*much.*	*gil.*
Sold	X	323	10	03	01	01	02
Ditto		478	11	04	01	00	03
Ditto		732	10	06	00	01	02
Total ſold		1535	00	06	01	01	03
Ballance due		1211	06	03	00	00	01
Proof		1535	00	06	01	01	03

V. Example, Dry Meaſure.

Nota, In one Chalder 16 Bolls, and in one Boll 4 Firlots, and in one Firlot 4 Pecks, and in one Peck 4 Forpts. *Scots* dry Meaſure.

	Chald.	*bolls.*	*firl.*	*peck.*	*forp.*
Bought	385	14	03	03	02
Item, more	473	12	02	01	03
Item, more	298	10	03	03	02
Total bought	1158	06	02	00	03

VI. Example, Land Meaſure.

Nota, In one Glebe 4 Acres, in one Acre 40 Roods, and in one Rood 6 Ells.

Sold

	Glebes,	*acres,*	*roods,*	*ells.*
Sold	748	03	17	04
Item, more	389	02	18	02
Item, more	978	02	16	03
Sold in all	2117	00	12	03

VII. Example, Baxters Weight.

Nota, In one Pound 12 Ounces, in one Ounce 20 Penny Weight, in one Penny Weight 24 Grains.

	Pounds,	*ou.*	*p. w.*	*gr.*
Bought from *T. D.*	732	10	12	14
Item, more	478	11	08	16
Item, more	347	08	06	12
Total bought	1559	06	07	18

VIII. Example, Apothecaries Weight.

Nota, In one Pound 16 Ounces, in one Ounce 8 Drams, in one Dram 3 Scruples, in one Scruple 20 Grains.

	l.	*ou.*	*dr.*	*ſcrup.*	*gr.*
Sold to *D. R.*	325	11	04	02	14
June 26th, more	497	08	03	01	12
Item, more	976	04	06	02	18
Total ſold	1799	08	07	01	04

Queſt. One Perſon lent to another at different Times, *viz.* At one Time he lent him 22 Pounds, 14 Shillings, 8 Pennies; at another Time 48 Pounds, 12 Shillings, 6 Pennies; and at another Time 18 Pounds, 18 Shillings, 10 Pennies. He came at a certain Time thereafter, and paid of what he had borrowed, 48 Pounds, 12 Shillings, 6 Pennies: Now I demand what he is reſting at that Term of Payment to his Creditor? See the Operation below.

		l.	*s.*	*d.*
Impr. Lent him		22	14	08
Item, more lent	*X*	48	12	06
Item, more		18	18	10
Total lent him		90	06	00
Ballance then reſting		41	13	06
Proof		90	06	00

Nota, Other Examples might have been adduced; but theſe given are ſufficient to clear the Method of working any Thing belonging thereto.

SUBSTRACTION.

THis Rule teacheth us to take one Figure or Quantity out of another Figure or Quantity; or, it is to take one total Sum of Payment made, out of one total Sum of Money lent, or Goods bought, in order to know the Ballance, or Debt reſting.

Nota, The total Debt goes ſometimes under the Notion of Subtrachend, which ſignifies the ſubject Matter out of which another Thing is to be taken. And the total Payment made goes under the Notion ſometimes of Subtractor, which ſignifies the Hand or Inſtrument to draw, or take ſomething out of that ſubject Matter ſo given. And the Difference betwixt theſe two, *viz.* the Subtrachend and Subtractor goes under the Notion of Ballance, which ſignifies the juſt Proportion betwixt theſe of total Debts, and total Payment made thereof; as is made plain from the following Examples.

To work the ſame, Begin at the right Hand of Quantities, and take the undermoſt Quantity from the uppermoſt Quantity, if it can be got therefrom; ſet down the Difference immediately below the ſame. But if the undermoſt Figure cannot be got in the uppermoſt, you muſt borrow one from the next Quality; and out of the Quantity therein contained, take your undermoſt Figure, marking what remains over, and add that to the Figure you could not get it out of, and their Total place below that greateſt Denomination, paying home what you borrowed (which is one Quality) when you ſubſtract the next; and ſo go on with the reſt, as above directed, till you put a Concluſion to the whole Subject demanded, as made plain below.

	l.	*s*	*d.*	*qrs.*
Lent in all to *D. R.*	16700	16	08	00
Paid in all by him	7897	14	06	02
Ballance reſting by him	8803	02	01	02
Proof	16700	16	08	00

Explication.

As I ſaid above, beginning at the right Hand, I ſay, Take 2 from 0, I cannot; but I am put to borrow one from its Neighbour Pennies, which will be 4 when converted to Farthings; ſo I ſay, Take 2 therefrom, there will remain 2. Having finiſhed that Part, I proceed to the next, which I find to be 6, carrying the one I borrowed, and joining it to the 6, makes 7: Then 7 from 8 the Figure above, I find 1 to remain, having borrowed nothing: I go on, and ſay, Take 14 from 16, there I find 2 to remain of Difference, which I place below the 14. Then I proceed (having borrowed none ſtill) and ſay, Take 7 from 0, I cannot,

not, but borrow from its next Neighbour, which I find to be the Place of Tens in whole Numbers, 1, ſaying, Take 7 from 10, I find 3 to be the Difference or Remainder, which I place below the 7. Then I go on with the one I borrowed, and add it to 9, which makes 10, ſaying, Take 10 from 0, I cannot, but 10 from 10 which I borrow, and 0 remains; which 0 I place below the 9, and ſo go on with my one borrowed, and add it to 8, the next Figure, which will make 9, ſaying, take 9 from 7 the Figure above, I cannot; but 9 from 10, ſo I find 1 remaining; which 1 I add to the Figure I could not get the 9 out of, being 7, which will make 8 a Remainder to be placed below that 8 in the Payment or Subtractor. Then I proceed to the next, with the 1 I borrowed, and 7 will make 8, which 8 I ſubſtract from 6 the Figure above, which I cannot, but 8 from 10 I borrow, ſo I find 2 to remain; which 2 I add to the 6, and it will make 8 to remain: And then the 1 I borrowed from the 1 in the Subtrachend, or total Debt, remains a Cypher or Point. Now, as with this Example, ſo with all others, according to their various Qualities.

Nota, To prove this, or any Operation belonging to Subſtraction, add the Payment made, and the Debt yet reſting together, obſerving Quantity in Quality, and their Total will be the Proof.

II. Example, of long Meaſure

	Ells	*qrs.*	*nails*
Sold in all to *D. T.*	1996	00	03
Paid in all by him	732	03	02
Ballance reſting	1263	01	01
Proof	1996	00	03

III. Example, *Averdupois* Weight.

	Stones	*pds.*	*ous.*	*drs.*	*grs*
Bought from *J. D.*	1334	15	11	10	02
Paid by him	732	12	12	11	14
Ballance due by him	602	02	14	14	24
Proof	1334	15	11	10	02

IV. Example, of Liquor.

	Hog.	*gal.*	*pint.*	*chop.*	*much.*	*gil.*
Sold in all	1535	00	06	01	01	03
Paid in all	323	10	03	01	01	02
Ballance due	1211	06	03	00	00	01
Proof	1535	00	06	01	01	03

V. Example, of Dry Meaſure.

	Chald.	*boll.*	*firl.*	*peck.*	*forp.*
Bought in all	1158	06	02	00	03
Paid in all	385	14	03	03	02
Ballance reſting	772	07	02	01	01
Proof	1158	06	02	00	03

VI. Example, of Land Meaſure.

	Glebes,	*acres,*	*roods,*	*ells.*
Sold in all	2117	00	12	03
Paid in all	748	03	17	04
Ballance	1368	00	34	05
Proof	2117	00	12	03

VII. Example, of Baxters Weight.

	Pounds,	*ou.*	*p. w.*	*gr.*
Bought in all from *T. D.*	1559	06	07	18
Paid in all by him	732	10	12	14
Ballance due	826	07	15	04
Proof	1559	06	07	18

VIII. Example, of Apothecaries Weight.

	l.	*ou.*	*dr.*	*ſcrup.*	*gr.*
Sold in all to *D. R.*	1799	08	07	01	04
Paid in all by him	325	11	04	02	14
Found reſting by him	1473	13	02	01	10
Proof	1799	08	07	01	04

Queſt. *A.* lent to *B.* firſt 342 Pounds, 18 Shillings; again he lent him 22 Pounds, 12 Shillings, 8 Pennies; and again he lent him 18 Pounds, 8 Shillings, 6 Pennies. At a certain Time thereafter, *B.* came to *A.* and paid him 218 Pounds, 18 Shillings, 8 Pennies: And at another Time he came and paid him 92 Pounds, 12 Shillings, 10 Pennies: And at another Time he came and paid him 28 Pounds, 8 Shillings, 4 Pennies. Now I demand what Ballance *B.* was owing to *A.* at the laſt Moiety paid him? See the Operation below.

	l.	*s.*	*d.*
A. lent to *B.* firſt	342	18	00
Item, again to *ditto*	22	12	08
Item, again to *ditto*	18	08	06
Total lent by *A.*	383	19	02

	l.	*s.*	*d.*
B. paid to *A.* firſt	218	18	08
Item, again paid to *ditto*	92	12	10
Item, again paid to *ditto*	28	08	04
Paid in all by *B.* to *A.*	339	19	10
Ballance found due by *B.* to *A.*	43	19	04
Proof thereof	383	19	02

Queſt. Tell me how old theſe Perſons are, who were born in theſe Years, 1648, and 1639, and 1654? *Nota*, Your preſent Year in which any ſuch Queſtion is propounded is your Subtrachend, and the Year born in is your Subtractor; So it is plain you muſt take the bygone Year, or Year born in, out of your preſent Year, and the Difference or Ballance between the two Dates will be your Perſon or Perſons Age ſo required. See the Operation.

	1ſt					
Preſent Year	1723	2d	1723	3d	1723
Year born in	1648		1639		1654
His or her Age	75	Age	84	Age	69
Proof	1723	Pr.	1723	Proof	1723

Queſt. Tell me how long it is ſince theſe Tombs or Palaces were erected or built, being erected and built in theſe Years, 63, and 48, and 27? Work this, and all others of this Kind, as the Example above.

	1ſt				
Preſent Year	1723	2d	1723	3d	1723
Year built in	63		48		27
Years ſince	1660	ſince	1675	ſince	1696
Proof	1723	Pr.	1723	Pr.	1723

Queſt. Tell me what I muſt be owing of 412 Pounds, 14 Shillings, if I be found to have paid thereof 348 Pounds, 16 Shillings, 8 Pennies.

Queſt. Tell me the Age of theſe Perſons born in theſe different Years, *viz.* In 1672, and 1659, and in 1679.

Nota, This Rule of Subſtraction intirely correſponds with the foregoing Rule of Addition, except a few in the cloſe thereof.

MULTIPLICATION.

THis Rule teacheth us to make any Figure, or Figures greater in Number than its Root or Spring would be by multiplying thereof by other Figures, one after another, according as they bear Relation to inferiour or ſuperiour Places and Degrees, as from the Work made plain.

Nota, The Terms of Multiplication are, Multiplicand, Multiplier, and Total, the Value of both Multiplicand and Multiplier. The Multiplicand is a ſubject Matter that allows of being multiplied by ſome other Thing. The Multiplier is that which performs the Office required by the Multiplicand, or ſubject Matter, and that is to make that ſubject Matter greater in Value. The Total is (as I ſaid before) the total Value of that Multiplicand and Multiplier ſo required to be multiplied. Having thus explained the Terms, I proceed next to its Foundation, *viz.* The Table.

TABLE

TABLE.

1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18
	3	9	12	15	18	21	24	27
		4	16	20	24	28	32	36
			5	25	30	35	40	45
				6	36	42	48	54
					7	49	56	63
						8	64	72
							9	81

Explication.

Say, as with the firſt Line of Figures uppermoſt being the Multiplicand, 2 Times 1 is 2, and 2 Times 2 is 4, and 2 Times 3 is 6, and 2 Times 4 is 8, *&c.*

Then ſay to the next that falls in Courſe, 3 Times 3 is 9, and 3 Times 4 is 12, and 3 Times 5 is 15, *&c.*

Then ſay, 4 Times 4 is 16, and 4 Times 5 is 20, and 4 Times 6 is 24, *&c.* Now as with theſe, ſo ſay with all the reſt, till you finiſh your Table upon your Memory.

I. Example.

Let your Multiplicand, or ſubject Matter be 78325 to be multiplied by 8, the Multiplier, which is to perform the Office, will ſtand thus,

7 Multiplicand, or ſubject Matter 78325
Pr. 2 2 to be multiplied by the Multiplier 8
8 Then the total Value of Multiplicand and Multiplier will be } 626600

Ex-

Explication.

The Way and Manner you are to perform this Example before, or any others belonging to Multiplication: Thus ſay, By carrying the Tens therein from one Figure to another, till done with all in the Multiplicand, ſetting down what remains over Tens therein every Time you multiply, and ſetting down all the Contents of the laſt Figure, thus, as before, 8 Times 5 is 40, which is 0, and carry 4 Tens to the next; then 8 Times 2 is 16, and 4 you carry, make 20, which is 0 to be ſet down, and carry 2 Tens. Then 8 Times 3 is 24, and 2 I carry is 26, which is 6 to ſet down, and carry 2. Then 8 Times 8 is 64, and 2 that I carry is 66, which is 6 to ſet down, and carry 6 Tens. Then 8 Times 7 is 56, and 6 that I carry is 62, which I ſet down at laſt, as you ſee before performed.

Nota, To prove this Work, or any like it, caſt out the 9s found firſt in the Multiplicand, and what remains in the laſt Figure thereof, place it in the uppermoſt End of your Croſs, as you ſee done thus, 5 and 2 is 7, and 7 and 3 is 10, which is 1 over 9, ſaying, 1 and 8 is 9, which is 0 remaining; then 0 being added to the 7, makes ſtill 7 remain, and ſo I place it in uppermoſt Part of my Croſs. Then caſt them out in the Multiplier, which is 8 leſs than 9, which Figure I place at the under Part of the Croſs, as you ſee in the Operation performed.

ormed. Then as you multiplied the Multiplicand 78325, by the Multiplier 8, ſo multiply the Remainder of the Multiplicand upon the upper End of the Croſs, being 7, by the Remainder of the Multiplier, being 8, which, when done (ſaying 8 Times 7) will be found to be 56. When theſe 2 Figures are added together, and 9 taken out of them, I find 2 to remain, which 2 I place upon the left Hand of the Croſs. Now if 2 remain in its Total, after the 9s are caſt out, it will be right, otherwiſe not, placing that which remains in its Total upon the right Hand of the Croſs, which muſt be in a Figure equal to that upon the left Hand, as you ſee done.

Nota, A better and more ſure Proof of Multiplication you ſhall have in Diviſion taught and ſhown you.

II. Example.

Let 47832 be required to be multiplied by 36, as a Multiplier, thus, as before place it.

6 Let 47832 Multiplicand, be
Proof 0 0 multiplied by 36 the Multipler.
0 286992
143496
Total is 1721952

III. Example.

Let 783239 of Multiplicand be multiplied by 432500, the Multiplier, thus place it, and all others like this Example. Put the Cyphers behind the Place of Units in the Multiplicand.

5	Multiplicand	783239
Pr. 7 7	Multiplier thus	432500
5		391619500
		1566478
		2349717
		3132956
	Total	338750867500

I. Queſtion.

Queſt. Tell me the Price of 7843 Ells of Cloath at 4 Pounds, 14 Shillings *per* Ell? To perform this, or any like it, you muſt multiply theſe Ells given twice, becauſe the Price of one Ell is of different Kinds, *viz.* both of Pounds and Shillings, and your Work will ſtand thus, as below.

Nota, Add the Pounds that come of your Shillings, to the Pounds Total, and then ſum them up, and the Total of theſe two will be the Price of your Ells given. See the Work.

	7843 Ells		7843 Ells
Multiply by	4 Pounds	multiply by	14 Shil.
Total l.	31372		31372
L. of ſh.	5490. 2		78430
Total	36862. 2	Half	1098. 02
			5490. 2
			l. *Anſ.*

Anſ. 7843 Ells will coſt you 36862 Pounds, 2 Shillings, as clear from the Work.

II. Queſtion.

Queſt. Tell me the Price of 843 Ells of Holland, or Muſline at 3 Pounds, 8 Shillings *per* Ell. Thus as above.

	843	Ells		843	Ells
Multiply by	3	Pounds	Mult. by	8	Shil.
	2529			674. .4	
	337 .4			337. .4	
Pounds	2866 .4			l. s.	

Anſ. 843 Ells will coſt you 2866 l. 4 s.

III. Queſtion,

Queſt. Tell me the Price of 28 Pounds of Butter at 5 Shillings *per* Pound? thus, 28 l.
mult. by 5 s.
14 .0
7 .0

Anſ. 28 Pounds of Butter will coſt you 7 Pounds

Nota, As you perform theſe Examples, ſo all others, according to their Kinds are to be performed.

Queſt. Tell me the Price of 784 Pairs of Gloves, at 14 Shillings *per* Pair?

Queſt. Tell me the Price of 472 Pairs of Stockins, at 2 Pounds, 8 Shillings *per* Pair?

DIVISION.

THis Rule teacheth to make an equal Diviſion of Money or Goods amongſt Perſons that are equally concerned therein, or therewith, ſo as they, and each of them may have their own proper Share thereof; and Debates ariſing many Times thereby may be ſhunned.

Nota, This Rule (as to its Operation) conſiſts of three eſſential Parts, *viz.* Diviſor, Dividend and Quotient or Quote. The Diviſor is in Place of the Perſons concerned, amongſt whom any Subject is dividable, and is placed upon the left Hand of the Dividend. And the Dividend is the Money or Goods that allow of Parts dividable: And the Quotient or Quote is the Share or Part that each Perſon has in that Dividend, whether it be Money or Goods, and is placed upon the right Hand of the Dividend or Subject that is dividable: That is to ſay, The Dividend is that which ſtands in the Middle betwixt the two contending Parties, *viz.* Perſons and their Shares, or Diviſor and Quote. Having thus made the Way plain, I come next to ſhew the Method of working the ſame.

Divi-

Then, to work any Leſſon belonging to this Rule, firſt, Ask how oft your Diviſor or Perſons can be got, in the firſt Figure or Figures in the Dividend, ſo many there, for ſo many in the Diviſor, or do anſwer their Places and Degrees. And as oft as you find them therein, place that Figure in the Quote: Then next, multiply the Diviſor, or Perſons by that Figure ſo placed in the Quote, and its Sum below the Figures in the Dividend, you asked how oft it would be got in. After that is done, ſubſtract the undermoſt Figure or Figures from the uppermoſt Figure or Figures in the Dividend, to which Remainder, take down another Figure out of your Dividend (putting a Point at it, as you take it down, in Caſe you ſhould come to work it twice) and place it behind your Remainder ſo given. And ſo ask the Queſtion anew, that is to ſay, Ask how oft your Perſons or Diviſor can be had in that Remainder, and Figure taken down, and as oft as you find the ſame, place it in your Quote, and after that is done, multiply and ſubſtract, as before directed: And ſo proceed from Figure to Figure, until your whole Dividend be wrought, after that ſame Way and Manner as you are directed to do, with the two firſt Operations thereof, as you will ſee plain from the Examples following. Thus.

```
           Dividend,Money or Goods,Quot.or Share.
Diviſor 6) 78767329 (13127888 multiply
or Perſons 6          it by     6 to prove
           --         --------
           18         78767329
           18
           --
            7
            6
            --
            16
            12
            --
             47
             42
             --
             53
             48
             --
              52
              48
              --
               49
               48
               --
                1 remains.
```

Explication.

Say, How oft will I find the 6 Perſons, or Diviſor in the firſt Figure in the Dividend, to wit, 7, which I find to be 1 Time, which 1 I place in the Quote; then, as before directed, multiply the 6 Perſons by that 1, which I find to be 6, this I place below the 7 in the Dividend. Being placed ſo, as in the Operation, I ſubſtract 6 from 7, and I find 1 to remain; to which Remainder 1, I take down the next Figure, to wit, 8, and place it behind the 1, which then will make 18 of Remainder. Then I ask, How oft I will get *6* the Diviſor in 18? and the Anſwer will be, 3 Times; which 3 I place in the Quote, and ſay, 3 Times *6* is 18, which 18 I place below the other 18; and then ſubſtract it, and finding nothing to remain, I put a Point at the next Figure to wit, 7, and take it down after that ſame Manner as before; and ſay, How oft will I get *6* in 7, the Figure taken down? I find it to be 1 Time, which 1 I place in the Quote, and then multiply the *6* by it, which I find to be *6*. Which Figure I place below the 7, and then ſubſtracting it, I find 1 to remain; to which Remainder I take down the next Figure, to wit, *6*, being pointed, I put it behind the 1, and I find it then to be 1*6*. In which 1*6*, I ask how oft I will get *6*? and I find it to be 2 Times; which 2 I place in the Quote, and then multiply the *6* by it, and I find it to be 12, which 12 I place under the 1*6*, and ſubſtracting it, then I find the Remainder to be 4; to which Remainder I take down the next Figure to be wrought, to wit, 7, and I find it to be 47. Then I ask, How oft the Diviſor *6* I can find in it? and I find it will be 7 Times; which 7 I place in the Quote, and then multiply the *6* by it, and I find it to be 42, which 42 I ſubſtract (being placed under the 47) I find the Remainder or Difference to be 5, to which 5 of Remainder I take down the next Figure, to wit, 3, which I find will make 53. Then I ask how oft I will find the Diviſor 6 in 53, and I find it to be 8 Times, which 8 I place in the Quote, then I multiply the 6 in the Diviſor by that 8, and I find it to be 48; which 48 I place under the 53, and then ſubſtracting it, I find 5 to remain; to which Remainder I take down the next Figure, to wit, 2, and I find it to be 52. Then I ask, How oft I will find 6 the Diviſor in 52, and I find it to be 8 Times; which 8 I place in the Quote, and then I multiply the Diviſor 6 by that 8, and I find it to be 48; which 48 I place under the 52, and then ſubſtracting it, I find 4 to remain; to which 4 I take down the other Figure, to wit, 9, and then I find it to be 49: Then I ſay, How oft will I get 6 the Diviſor out of 49? I find it to be 8 Times; which 8 I place in the Quote; then I multiply the Diviſor 6 by that 8, and I find it to be 48; which 48 I place under the 49, which ſubſtracting from it, I find 1 to be a Remainder, without any to be taken down.

Nota, To prove the ſame, you muſt multiply your Quote or Share (as you ſee done) by the Diviſor or Perſons; and as you multiply the ſame, take in your Remainders according to their Places and Degrees they bear Relation to, and ſo proceed, ſetting down what is over the Tens, and carrying the Tens from one Figure to another, as you have Opportunity to multiply. Now as with this Example, you do ſo with all others belonging to this Rule; only obſerve their various Kinds.

Nota, As I promiſed to give you a more ſure Proof of Multiplication when I came to Diviſion, than by caſting out the 9s, ſo I perform it in the firſt Example you have therein given you, which lies in 626600 the Total of the Multiplicand, being 78325 to be multiplied by 8, and thus it ſtands to be proven.

Diviſor 8) 626600 (78325
56 8
66 626600
64 Proof.
26
24
20
16
40
40

As with this Example, ſo with all others. For ſure it is, that Multiplication is the beſt Proof for Diviſion, and Diviſion for Multiplication.

Let it be required to divide 8767802 of a Dividend, by the Diviſor 47300, let it ſtand thus as below, as alſo all others of that Kind.

Dividend. Quot. or how oft.
Diviſor 473. 00) 87678. 02 (185
473 47300
4037 55802
3784 1302
2538 741
2365 87678.02 Proof.
.17302 reſts.

Nota, Wherever you have Cyphers in your Diviſor, as before, cut them off, and alſo as many Figures in the Dividend, as you have of Cyphers in the Diviſor, and then proceed to work the reſt as above, taking down theſe cut off in the Dividend, and add them to your Remainder, in reſpect to their Places, as before you ſee in the Example performed; proving the ſame, and all others, as before directed.

Queſt. Divide 84325 Pounds, 12 Shillings amongſt 12 Perſons at Work? Thus,

Diviſor 12)84325(7027 l.
or Perſons 84
32
24
85
84
1 l. reſt. convert
multiply by 20 to s. take 12
12)32(2 ſhil.
24
8
multiply by 12 *pen.* in one *s.*
16
8
12)96(8 d.
96

Anſ. Each Perſon will have to his Share 7027 l. 2 s. 8 d. of that dividend 84325 l. 12 s.

Nota, You muſt not take the Place of Tens oftner than what you can find the Place of

Units in its proper Figure, as before. As with this ſo with all other Examples, according to their Places.

Queſt. Divide 85643 Ells, 3 Quarters, 2 Nails of Cloath amongſt 438 Perſons, or Merchants? Thus.

```
Diviſor 438)85643(195 Ells
or Perſons  438
            ----
            4184
            3942
            ----
            .2423
             2190
             ----
     Ells    .233 remaining
 multiply by    4 the Quarters in one Ell
             ----
         438)935(2 Quarters
             876
             ----
             .59
 multiply by   4 the Nails in one Quarter
             ----
         438)238(0 Nails
             reſt.
```

Anſ. Each Perſon will have to his Share 195 Ells, 2 Quarters and $\frac{238}{438}$

Queſt. Divide 4325003 Glebes, 3 Acres of Land amongſt 312 Creditors? Thus operate as above, taking in your 3 Acres, when you convert the Remains of your Glebes to Acres.

```
Diviſor 312)4325003(13862 Glebes
            312
            1205
             936
            2690
            2496
           .1940
            1872
             683
             624
             .59
multiply by    4 the Acres in one Gb.
             239 (0 Acres
multiply by   40  the Rds. in one Ac.
         312)9560(30 Roods
             936
            .200
               6 Ells in one Rood
           )1200( 3 Ells
             936
             264  reſts.
```

Anſ. Each Perſon will have to his Share 13862 Glbs. 30 Roods, 3 Ells and $\frac{264}{312}$

Some Queſtions to be performed by the Scholar with the Maſter's Help.

Queſt. Divide 783283 Hogſheads, 12 Gallons, 4 Pints amongſt 212 Creditors? Work this, and others following after that ſame Way and Manner as you ſee the former Examples have been wrought, according to their various Kinds and Qualities.

Queſt. Divide 843256 Stones, 12 Pounds, 8 Ounces of Cheeſe or Butter amongſt 434 Creditors?

Queſt. Divide 735600 Chalders, 10 Bolls, 2 Firlots of Barley or Meal amongſt 218 Merchants equally concerned?

Queſt. Divide 976432 Pounds, 8 Ounces of Drugs amongſt 732 Apothecaries?

Queſt. Let there be divided 876432 Pounds, 10 Ounces of Wheat amongſt 39 Baxters?

Q. Divide 473253 Stones, 8 Pounds of Hay amongſt 300 Troops of Horſes?

Nota, In one Stone of Hay there are 20 Pounds, and in one Pound 20 Ounces, and in one Ounce 20 Drops, and in one Drop 40 Grains.

REDUCTION.

THis Rule teacheth us to reduce, or bring one Kind, or Quality to another; and that either by Multiplication, or Diviſion.

Nota, When any Thing is required to be reduced to a greater Denomination, it is to be reduced thereto by Multiplication of Quantity contained in Quality. But if again any Thing ſhould be required to be reduced from a greater Denomination or Number, to a leſſer Denomination, it is to be done by Diviſion of

Quantity contained in Quality; as made plain from the following Examples.

I. Example.

Queſt. Reduce 843 Pounds to Pennies, and back again: In which Example you will ſee the Nature of the Rule, both as of greater to leſſer, and leſſer to greater performed.

Table it thus,

843 Pounds
mult. by 20
16860 Shill.
mult. by 12
33720
16860
202320 Pen. therein

Back again thus,
Pennies 20)
12)202320(1686. 0
12
82 or ½ 843. 0
72
103
96
72
72
0

Or you may perform it thus, as below

843 Pounds
240 the Pennies in one Pound.
33720
1686
24. 0)20232. 0(843 Pounds
192
103
96
72
72
0

Thus it is plain, that 202320 Pence are equal to 843 Pounds; or theſe Pounds are equal to 202320 Pennies.

Nota, To perform this Example, you muſt multiply theſe given, 843 Pounds by 20, and the Product thereof will amount to 16860 Shillings; and theſe Shillings multiplied by 12, will amount to 202320 Pennies. To go back again to the Fountain, you muſt divide the total Product of Pennies in theſe given Pounds, by 12 firſt, and then its Quote divide by 20, or half them, with cutting off a Figure towards the right Hand for the Cypher in the Diviſor; and then the Sum will come out 843 Pounds. Or you may multiply this, or any like it by 240, and the total Product will be Pennies therein. Which total Product of Pennies divide by 240, and the Quote will be your Pounds therein contained.

Nota, As with this Example, ſo with all others belonging to Reduction; only conſider the Relation it hath to leſſer or greater Numbers, and ſo perform it by its Quantity contain'd in Quality, as before directed.

II. Example.

Queſt. Reduce 8564 Pounds to Merks, and back again? *Nota*, In one Pound there are 3 half Merks, and there are 2 half Merks in one Merk; that is to ſay, (being a leſſer required to reduce to a greater Number) you muſt multiply your Pounds by 3, and the

Product thereof you muſt divide by 2, or half them without cutting off any Figure, (becauſe it is a greater Number to be reduced to a leſſer) and the Product thereof will be your Merks therein contain'd, as clear from the Work, thus.

8564 Pounds
mult. by 3 ½ Mks therein
Di. 2) 25692
½ 12846 Merks
mult. by 2
25692 half Merks

half Merks
Di. 3)25692(8564 l.
24
16
15
19
18
12
12

Anſ. In 8564 Pounds there are 12846 Merks.

Queſt. Reduce 1000 Merks to Pounds; multiply theſe given Merks by 2, and the total Product thereof divide by 3, and the Quote will be your Pounds therein, as before directed.

Merks
1000
2
Div. 3) 2000 (666 *l.* 13 *s.*4 *d.*in theſe 1000 *m.*
18
20
18
20
18
Reſt 2 half Merks, or 13 *s.* 4 *d.*

Queſt. Reduce 78432 Pounds *Sterling*, to Pounds *Scots*, both by Addition and Multiplication.

Nota, To reduce it by Addition, you muſt ſet it (or any Sum of Pounds) down 3 Times below other, only miſſing the Place of Units in your ſetting of it down the third Time, which will increaſe its Number upon the left Hand thereof; and when ſo placed, add them up as you did the Integers of Addition, and the total Product thereof will be your Pounds *Scots* therein contained. As for the Multiplication Part thereof, ſet down your Sum of Pounds given, and multiply the ſame by 12 the Pounds *Scots* in one Pound *Sterling*, and the Total thereof will be your Pounds *Scots*. See the Work.

Addition's Part		Multiplication's Part.	
	78432 l.		78432 l.
	78432	mult. by	12
	78432		156864
l. *Scots*	941184		78432
		l. *Scots*	941184

Anſ. In 78432 Pounds *Sterling*, there are 941184 Pounds *Scots*.

Queſt. Reduce 941184 Pounds *Scots*, to Pounds *Sterling*.

```
Divide by 12)941184 (78432 Pounds Sterl
             84
             ---
             101
              96
              ---
               51
               48
               ---
                38
                36
                ---
                 24
                 24
```

Anſ. In 941184 Pounds *Scots*, there are 78432 Pounds *Sterling*.

Queſt. Reduce 78976 Guineas to Pounds *Sterling*, and theſe to Pounds *Scots*, and back again.

Nota, In working this, or any like it, multiply by 21 (the Shillings in one Guinea) theſe Guineas. The Product thereof divide by 20, or half them, cutting off a Figure upon the right Hand, and the total Product ſo halfed, will be Pounds *Sterl.* Which Pounds you may multiply by 12, and the Total thereof will be your Pounds *Scots* required; remembring, in the mean Time, the Shillings that are cut off in Halfing, to convert them to Pounds *Scots*; and ſo aſcend to Guineas again as you deſcended, obſerving to divide where you multiplied, and multiply where you divided.

Queſt. Reduce 73893 Crowns to Pounds *Sterling*, and back again? divide your Crowns given by 4; the Crowns in one Pound *Sterling*, and the Quote thereof will be your Pounds *Sterling* therein; and ſo go back by multiplying where you divided.

Queſt. Reduce 47832 Shillings *Sterling* to Pounds *Scots*? divide the Shillings by 5, the the Quote whereof multiply by 3 the Pounds *Scots* in one Crown, or 5 Shillings *Sterling*.

Queſt. Let it be required to multiply *6* Pounds, *6* Shillings, *6* Pennies, by *6* Pounds, *6* Shillings, *6* Pennies, and to reduce them to Value of Pounds therein? Your Work will ſtand thus.

Multiplicand			Multiplier
6 : 6 : 6			*6 : 6 : 6*
20	Multip. Total is 1518 *d.*		20
126	Multr. Total	1518 *d.*	126
12		12044	12
258		1518	258
126		7590	126
Tot. 1518 *d.*		1518 Tot.	1518 *d.*
	Pennies	2304324	

Nota, To reduce theſe Pennies 2304324 to Pounds, in order to know the Value of *6* Pounds, *6* Shillings, *6* Pennies, being multiplied by it ſelf, know, that they muſt be twice (to wit, the Pennies, firſt their Total, and then the Quotient thereof) divided by 12, in order to reduce them from improper Pennies, to proper Pennies. The Reaſon is, becauſe they are twice multiplied in themſelves, as clear from the Example before. Alſo to reduce theſe Pennies in the ſecond Quote, or proper Pennies ſo called, you muſt divide them by 20, or half them, by cutting off a Figure upon the right Hand; and then the Quote thereof you muſt again half, with the ſame cutting off as before, and that for the ſame Reaſon as above. Then the Pounds coming by your laſt or ſecond halfing, will be your proper Pounds, or true Value of 6 Pounds, 6 Shillings, 6 Pennies, multiplied by it ſelf. See the Work thus.

```
             12)       ½)
12)2304324(192027(1600. 2
   12         12    ½  80. 0
   110        72 Anſ. 40 l. 0 s. 3. d. the Value
   108        72       thereof
     24      027
     24       24
      32       3 d.
      24
       84
       84
```

Nota, As with this Operation, ſo with all others of this Kind. As oft as you multiply, you divide as often in vulgar Terms.

GOLDEN RULE,

OR,

RULE of THREE.

THis Rule is termed ſo, becauſe of its Excellency and Uſefulneſs in reſolving hard (tho' neceſſary) Queſtions, or of its taking (by its Operations) a direct and plain Courſe to find out an Anſwer to a Matter or Demand made, as yet not known, ſo as it may adminiſter Calm to a perturbate Demand.

Nota, This excellent Rule of Three (which may well be called the Prince of Rules in Arithmetick) conſiſts of three principal Rules, *viz. Rule of Three direct*, *Rule of Three indirect*, and *Rule of Three Compound*. We begin with the firſt of theſe, *viz. Rule of Three direct.*

The RULE of Three direct.

It is ſo called, becauſe of its plain, eaſy and direct Way it takes by its Operations in three principal Terms, to give Solution to an uneaſy Demand, who ſtill craves till Satisfaction be given.

Nota, This Rule conſiſts of a greater Number requiring more. To know its Terms aright take theſe Marks to know them by; and in giving them to you, I ſhall firſt explain the Terms themſelves, and then adduce their Marks. Know, the firſt Term is called, *Suppoſition*, which is a Matter ſuppoſed in Place of a real Matter or Thing: And its Marks are, *If*, *That*, *There*, *At*, *&c.* The ſecond Term is the *Subſtance* or Price of that ſuppoſed Matter, or firſt Term, and is known by its being ſo. The third Term is called *Demand*, becauſe it is a Term that craves and wants an Anſwer. Know it by theſe Marks, *viz.* *What*, *When*, *How ſoon*, *How long*, *Tell*, *At*, and ſuch like Marks.

To table the ſame in order to Operation, ſee that your firſt Term or Suppoſition be of that ſame Kind and Quality with your third Term or *Demand*: And if any one of them conſiſts of various Denominations, or if both ſhould conſiſt of various Denominations, then be ſure to reduce them into one Kind, before you proceed to work the Terms in one another; as afterward you ſhall be directed. Then, after that is done, ſee that your ſecond Term or *Subſtance* be of that ſame Kind with what your third Term or *Demand* requires: And if your ſecond Term conſiſts of more Denominations than one, reduce to one by Quantity contained in Quality.

To work the ſame (after it is thus tabled) multiply your ſecond Term or *Subſtance Total* by your third Term or *Demand's total* Product; the Total of which two Terms you are to divide by the Total of the firſt Term or *Suppoſition*. *Nota*, Whatever remains, or is in your Quote, after the firſt Diviſion thereof, will be of that ſame Kind with your ſecond Term or *Subſtance*; ſo what remains after the firſt Diviſion thereof, convert to the next Quality, and that by multiplying thereof by the Quantity contained in one of the preceeding Qualities. As made plain from the Example following.

Queſt. If 8 Ells, 3 Quarters of Cloath coſt me 28 Pounds, 18 Shillings, what will 48 Ells thereof coſt me, if I ſhould incline to buy it?

Explication.

It is plain, that the 8 Ells muſt be the *Suppoſition*, becauſe it hath the Mark of a *Suppoſition* prefixt to it, to wit, *If*: And it is as plain, that the ſame very Term conſiſts of various Denominations, to wit, of 8 Ells, 3 Quarters; and becauſe of that, I muſt reduce theſe 8 Ells to Quarters, in order to take in theſe 3 Quarters; and this muſt be done by multiplying thereof by 4, the Quantity of Quarters in one Ell the Quality. When this is done, I take a look of my third Term, and I find it to be only Ells, to wit, 48; and it not being of the ſame Denomination and Kind with the firſt Term, I muſt convert it to Quarters, to make them both of one Kind; and this

I muſt do by multiplying of theſe 48 Ells by 4, as I did the firſt Term. They then being one Kind, I proceed to look into my ſecond Term, and I find it to be of Money 28 Pounds, 18 Shillings, agreeable to what the third Term requires, being Money for its Price. But at the ſame Time I find it to conſiſt of various Denominations, for which Cauſe I muſt reduce it to one Denomination or Kind, to wit, I muſt reduce theſe 28 Pounds to Shillings, in order to take in my 18 Shillings; and this I do, by multiplying thereof by 20, the Shillings in one Pound the Quality. Having thus far prepared my Terms, and made them agreeable to what I am directed to have them; I proceed next to the Method of working the ſame, which is to multiply the Product or Total of Shillings in the ſecond Term, by the Product or Total of Quarters in the third Term; and the total Product of theſe two Terms I divide by the total Product of Qnarters in the firſt Term, finding that which will fall to remain, and be in the Quotient will be Shillings, becauſe the ſecond Term was reduced to Shillings, and ſo they muſt be Shillings alſo. All which you will ſee clear from the Work, which ſtands as follows. See, you table all your Queſtions belonging to this Rule of Three after the ſame Way and Manner, as you ſee done in this following Example.

Ells, qrs. l. s. Ells
If 8— 3— 28— 18—*qt.* 48
4 20 4
qrs. 35 578 *ſhil.* 192 *qrs.*
192
1156
5202
578
Divide by 35) 110976 (317.0
105 $\frac{1}{2}$:158: 10 *ſhil.*
59 *l.*
35
247
245
26
Multiply by 12 *d.* in one *ſhil.*
52
26
Divide by 35) 312 (8 *d.*
280
32
Multiply by 4 Farth. in a Penny
Divide by 35) 128 (3 Farthings
105
23 reſt

Anſ. 48 Ells will coſt you 158 Pounds, 10 Shillings, 8 Pennies, 3 Farthings, and $\frac{23}{35}$

II. Example.

Queſt. Tell me what I muſt pay for 484 Nolt, if 28 of the ſame Nolt coſt me 382

Pounds, 12 Shillings. *Nota*, Your firſt Term and third are alike as to their Kind in the Queſtion; but the ſecond Term conſiſts of various Denominations: And therefore you muſt reduce it to one Denomination, *viz.* the Pounds to Shillings, by multiplying them Pounds by 20, as before directed; and at the ſame Time as you multiply, take in your Shillings according as they bear Place and Relation; that is to ſay, Take in the Units of Shillings in the Place of Units, and Tens in the Place of Tens, as evident from the Work it ſelf.

Nolt, *l.* *s.* *Nolt*
If 28——382—12—*qt.* 484
20
7652
484
30608
61216
30608
Divide by 28 the firſt Term) 3703568 (13227. 0 *s. d. qrs.*
28
$\frac{1}{2}$ 6613 : 10. 3. 1. $\frac{20}{28}$
l.
90
84
63
56
75
56

196
196
8
multiply by 12 *d.*
28) 96 (3 *d.*
84
12
multiply by 4 Farthings
28) 48 (1 Farthing
28
20 remain

Anſ. 484 Nolt will coſt you 6613 Pounds, 10 Shillings, 3 Pennies, 1 Quarter, and $\frac{20}{28}$ Parts.

III. Example.

Queſt. Seing that I am to give for 48 Sheep 118 Pounds, 14 Shillings, 4 Pennies, what muſt I pay for 232 Sheep of that ſame Kind, if I incline to buy them? Let your Operation ſtand thus, as before.

ſh. *l.* *s.* *d.* *ſh.*
If 48— 118—14—4— *qt.* 323
20
2374
12
4752
2374
28492
multiply by 232 Sheep

```
                     56984
                     85476
                     56984     12)
divide by 48)  6610144(137711(1147.5 s.  d. q.
               48        12   ½ 573:15:11:1
               181       17       l.
               144       12
                370      57
                336      48
                 341      91
                 336      84
                  54      71
                  48      60
                   64     11 Pennies
                   48
                   16 d. remains
     multiply by    4 Farthings
              48)  64 ( 1 Farthing
                   48
                   16  remain
```

Anſ. 232 Sheep will coſt you 573 Pounds, 15 Shillings, 11 Pennies, 1 Farthing, and $\frac{16}{48}$, as clear from the Work.

Nota, It is evident from the Work above, that my 2d Term muſt be reduced to Pennies, in order to take in the 14 Shillings, and 4 Pennies, a Part of their Price; ſo that the Quote muſt be Pennies, and remainder Pennies: And therefore I am obliged to convert my firſt Quotient to Shillings, in dividing thereof by

12 the Pennies in one Shilling, as you ſee from the Work: And the Quotient coming thereof I half, by cutting off a Figure upon the right Hand, and the half thereof is my Pounds, and the Remains Shillings, being the Price of my 232 Sheep in Pounds and Shillings, with the reſt of my broken Parts, as the Work doth ſhow.

IV. Example.

Queſt. Tell me what I muſt pay for 18 Chalders, 12 Bolls, 2 Firlots of Barley or Wheat, there being paid for 4 Chalders thereof 420 Pounds, 12 Shillings formerly?

```
     Chald.     l.      s.       chald. bol. firl.
If    4———420———12—— qt. 18———12———2
     16         20               16
     24       8412              110
      4                          19
     64                         300
      4                           4
    256                        1202
        multiplied by          8412   the 2d Term
                               2404
                              1202
                             4808
                            9616
        Diviſor 256)    10111224 (3949.6
                            768   ½ 1974. 16
  Anſ. 18 Chalders,        2431      l.    s.
  12 Bolls, 2 Firlots      2304
                                          1272
```

will coſt you 1974 Pounds, 16 Shillings, 11 Pennies, 2 Farthings, and $\frac{128}{256}$

```
       1272
       1024
       ----
        2482
        2204
        ----
         1784
         1536
         ----
          248
           12
          ---
          496
         248
         ----
  256)  2976( 11 Pennies
        256
        ---
         416
         256
         ---
         160
           4
         ---
  256   )640( 2 qrs.
         512
         ---
         128
```

V. Example.

Queſt. Tell me what I muſt pay for 98 Hogſheads, 12 Gallons of Wine, if 14 Hogſheads of the ſame Wine coſt me 4328 Pounds, 14 Shillings, 8 Pennies? *Solution*, You muſt multiply your 98 Hogſheads by 16 Gallons, in order to take in your 12 Gallons, and that in its own proper Place; and you muſt, after that is done, multiply your *Suppoſition*, *viz.* the 14 Hogſheads by 16 the Gallons in one Hogſhead, for that End, that your third Term and firſt may be of the ſame Kind the one with the other. Afterwards convert your Pounds to Shillings and Pennies, in order to take in your 14 Shillings and 8 Pennies in their own proper Place: And ſo proceed as with the foregoing Examples.

H. *l.* *s.* *d.* *H.* *gal.*
If 14—4328—14—8 *qt.* 98 12

VI. Example.

Queſt. If I pay for 12 Glebes, 3 Acres of Land 7324 Pounds, 14 Shillings, what will 58 Glebes thereof coſt me? It will ſtand thus.

Glb. *ac.* *l.* *s.* *Glb.*
If 12—3—7324—14 *qt.* 58

VII. Example.

Queſt. Tell me the Price of 348 Pounds of Drugs, if 48 Pounds, 10 Ounces thereof coſt me 128 Pounds, 12 Shillings, 4 Pennies. Table it thus.

l. *ou.* *l.* *s.* *l.*
If 48—10—128—12 *qt.* 348

VIII. Example.

Queſt. I demand the Price of 58 Firkins of Soap at the Rate of 56 Pounds, 18 Shillings for 8 of the ſame Soap. Thus.

Firk. *l.* *s.* *firk.*
8——56 : 18 *qt.* 58

IX. Example.

Queſt. If I pay for the Carriage of 4 Packs Wool from *Edinburgh* to *Dalkeith*, being 4

Miles, 2 Pounds, 8 Shillings, what will I pay for them to *Stirling*, being 24 Miles? Thus, If 4 Miles 2 Pounds, 8 Shillings, *qt.* 24 Miles.

RULE of Three indirect.

It may be ſo called, becauſe of the indirect Courſe it takes (as to the Performance of its Operation) in Oppoſition to the foregoing Rule of Three direct.

Nota, It conſiſts of the ſame three Terms with the former Rule, but its *Demand* is a more Number, requiring leſs than the *Suppoſition* as to its Anſwer.

To table the ſame, take care that your firſt Term and third, or *Demand*, be of the ſame Kind the one with the other. And let your ſecond Term be of that ſame Kind with what your *Demand* requires.

To work the ſame after it is thus tabled, multiply your ſecond Term (being one Kind) by your firſt, and the Total of theſe two Terms divide by your third Term or *Demand*. Know, that whatever remains, or is in your Quote, is of the ſame Kind with your ſecond Term. See the Example.

I. Example.

Queſt. If 8 Men conſume in 2 Months, 2 Weeks, 138 Pounds, how ſoon will 48 Men conſume the ſame? Or how long Time will it laſt them? See the Work.

Men, *mon.* *w.* *men*
If 8—— 2— 2— *qt.* 48
4
10
8
Divide by 48) 80 (1 Week
48
32
Multiply by 7 Days in one Week
divide by 48) 224 (4 Days
192
32
multiply by 24 Hours
128
64
48) 768 (16 Hours
48
288
288

Anſ. 48 Men will eat it up in 1 Week, 4 Days, 16 Hours.

Explication.

I find my firſt and third Terms in this Example to be of one Kind; but I find the ſecond Term to conſiſt of two Denominations, *viz.* Months and Weeks: Therefore I muſt convert the 2 Months therein to Weeks, in order to take in my 2 Weeks; and ſo by this they become one Kind, and that by multiplying the two Months by 4 the Weeks in one Month, after

I have found its Total, I multiply the ſame by the firſt Term's Total, *viz.* 8, and I find the Total of them 2 Terms to be 80, which 80 I divide by my third Term, *viz.* 48. When ſo divided, I find my Quote to be 1 Week, and the Remainder to be 32 Weeks; which, (becauſe I cannot get the Diviſor out of it) I muſt convert to Days, by multiplying thereof by 7 the Days in one Week, and then the Product will be 224, which I divide again by the 48, and I find its Quote to be 4 Days, and the Remainder 32; which 32 Days remaining, I convert to Hours, by multiplying thereof by 24 the Hours in one Day. When ſo done, I find the Product to amount to 768 Hours; which Hours I again divide by the 48, and I find its Quote to be 16 Hours, and nothing remaining. So I conclude (as in the Anſwer) 48 Men will conſume, or ſpend that Money in one Week, 4 Days, 16 Hours. Now as with this Example and Operation, ſo with all others belonging to this Rule.

II. Example.

Queſt. If 28 Shearers cut down theſe Fields of Corns in 1 Month, 2 Weeks, how ſoon would 48 Shearers, (if imployed) cut them down.

Shear. mon. w. ſhear.
If 28—— 1— 2— *qt.* 48.
4
6
28
48

```
          48
          12
    48) 168 ( 3 Weeks
        144
        ———
         24
          7 Days in the Week.
    48) 168 ( 3 Days
        144
        ———
         24
         24 Hours in a Day
        ———
         96
         48
    48) 576 ( 12 Hours
         48
        ———
         96
         96
```

Anſ. 48 Shearers will cut it down in 3 Weeks, 3 Days, 12 Hours.

III. Example.

Queſt. Tell me how ſoon 732 Men imployed will caſt theſe Trenches, which took 219 Men 4 Days, 6 Hours. Perform as above, thus.

Men, days, hours, men

If 219 —— 4 — 6 — *qt.* 732

IV. Example.

Queſt. Tell me how long Time 148 Horſes will be in conſuming theſe Oats and Hay, which 48 Horſes conſumed in 9 Months, 3 Weeks.

Horſes, mon. w.

If 48 —— 9 — 3 — *qt.* 148

Queſt. Tell me how ſoon 64 Taylors will mount theſe Regiments, conſiſting of 3848 Men, if 28 Taylors formerly mounted them in 9 Months, 3 Weeks, 4 Days? Thus.

```
     Tay.      m.   w.   d.            Tay.
  If 28——— 9— 3— 4— how ſoon 64
               4
             ———
              39
               7
             ———
             277
               8
            ————
            2216
             554     7)     4)
           —————
     64) 7756  (121  (17  (4 Months
           64       7    16
          ————    ———   ———
           135     51     1 Week
           128     49
          ————
            76      2 Days
            64
          ————
            12
            24
          ————
            48
           24
          ————
     64)   288 (4 Hours
           256
          ————
            32
            60
          ————
     64)  1920 (30 Minutes
          192
          ————
            0
```

Anſ. 64 Taylors will do it in 4 Months, 1 Week, 2 Days, 4 Hours, 30 Minutes.

Nota, You ſee, that your ſecond Term is reduced from Months to Weeks and Days; and therefore your Quotient muſt be divided by 7 and 4, as above, to bring it back.

VI. Example.

Queſt. If 18 Maſons build a Park Dyke, conſiſting of 3254 Roods, in 4 Months, how ſoon will 38 Maſons build the ſame, if imployed?

Maſ. *Months,* *Maſ.*
If 18——4—— *qt.* 38

VII. Example.

Queſt. If a Weaver that works but 6 Hours of the Day, put out his Web in 8 Days, how ſoon will one that works 12 Hours of the Day get it out? Thus.

If 6—— 8— 12
Hours, *days,* *hours*

RULE of Three Compound.

It is ſo called, becauſe its three principal Terms are compounded with other two ſub-principal, or relative Terms, in order to find a 6th, or Anſwer to the 4th Term or third in Order; which is the *Demand*, or that which craves a Solution.

Nota, This Rule is capable to anſwer all the Queries that the double Rule of Three, (ſo called by ſome) can perform, or demand, to be performed by any: And therefore I omit giving it place in this Book.

To table the ſame, let your firſt Term, or *Suppoſition* be of that ſame Kind with your 4th Term, or *Demand*. And let your ſecond Term and fifth Term be of one Kind or Quality. And let your third Term be of that ſame Kind with what your *Demand* requires. That is to ſay, If your *Demand* require Money, your third Term muſt be Money. And if your *Demand*, or 4th Term require Goods, or any other Thing for an Anſwer thereto, your third Term muſt be Goods, or ſome other Thing.

Nota, If any of theſe 5 Terms, (ſo called) be of more Qualities than one, you muſt take care (before you proceed to work) to reduce them to one Quality, or Kind.

To work the ſame (after it is thus tabled as above directed) you muſt multiply your ſecond Term in order by your firſt Term, or *Suppoſition*: And of their Total make your Diviſor. After this is done, proceed to multiply your fourth Term, or *Demand*, by your 5th Term the Total of which two Terms, multiply by your third Term; the Total of which three Terms ſo multiplied in one another, make your Dividend; and ſo proceed as with the *Rule of Three direct*, obſerving, as I ſaid before, whatſomever remains, or is in your Quote, after Diviſion thereof, will be of the ſame Kind with your third Term, or ſecond in order, when conſidered as three principal Terms mainly concerned.

Now that is to ſay, the Total of your firſt and ſecond Terms is your Diviſor, and the Total of third, fourth and fifth Terms ſo multiplied, in one another is your Dividend, as plain from the Example following.

I. Example.

Queſt. If 18 Men ſpend 84 Pounds, 12 Shillings in 4 Months, 2 Weeks, what will ſerve (after that Way of Living) 38 Men 9 Months? Thus.

Men, *m.* *w.* *l.* *s.* *men*, *m.*
If 18—4—2—84—12—*qt.* 38—9
18 4 20 36 4
144 18 *w.* 1692 228 36 *w.*
18 114
324 1368
1692
2736
12312
8208
1368
Divide by 324) 2314656 (714 . 4
2268 ½357 : 4
466 *l.* *s.*
324
1425
1296
1296
1296 *Anſ.*

Anſ. 38 Men will conſume in 9 Months after that Way of Living, 357 Pounds, 4 Shillings, as clear from the Work.

Explication.

You ſee from the Operation done, that your firſt Term and fourth are of one Kind, to wit, Men: But I find the ſecond Term and the fifth to differ as to their Denomination; the ſecond Term is 4 Months, 2 Weeks, whereas the fifth is 9 Months: And therefore to make them of one Denomination, I muſt multiply my 9 Months, by 4 the Weeks in one Month, in order to convert theſe 9 Months to Weeks, becauſe I am obliged to convert the ſecond Term 4 Months to Weeks, in order to take in my 2 Weeks, and by ſo doing, you ſee them become one Kind, and ſo the ſame Denomination with the fifth Term. Again, you ſee that your third Term anſwers to what the Demand requires, which is Money to ſerve theſe 38 Men; but I find it to conſiſt of two Denominations or Kinds, and that is of Pounds and Shillings; for which End I muſt of Neceſſity convert theſe 84 Pounds to Shillings, in order to take in the 12 Shillings, as you ſee plain by the Work. After the Way is cleared, thus I proceed, and multiply the firſt Term 18 Men by the ſecond 18 Weeks, and their Total for a Diviſor is 324. Then I proceed, and multiply my fourth Term, to wit, 38 Men by my fifth Term 36 Weeks, and their Total amounts to 1368, 1368, which Total I multiply again by my third Term's Total, to wit, 1692 Shillings, and the total Product then will amount to (for a Dividend) 2314656, which will be according to their Places and Degrees 2 Million, 3 hundred and 14 thouſand, 6 hundred and fifty ſix Shillings, it being of that ſame Kind with your third Term. Then I proceed, and ask how oft I can get 3 the Place of 100 in the Diviſor, out of the ſame Place in the Dividend, which I find to be 23, being obliged to take in 4 Figures at firſt in the Dividend, to anſwer the 3 Figures in the Diviſor, becauſe 3 in the Place of Hundreds in the Diviſor, cannot be got in the firſt Figure in the Dividend, to wit, 2. So I find I will have it 7 Times, which Figure I place in my Quote, and ſo proceed Figure after Figure, till done with the Dividend's Total, as fully directed in the Explication of Diviſion.

Nota, As the Method is in working of this Example, ſo let it be your Care to follow the ſame, in reſpect to placing its Terms aright in order to Operation, with all the other Examples belonging to this Rule. I leaue you two Examples for this Purpoſe.

Queſt. Tell me what will ſerve 48 Horſes 6 Months, 3 Weeks, if 28 of the ſame Horſes conſume 4 Chalders, 3 Bolls in 8 Months? Thus.

Horſe, mon. ch. bol. *horſ. m. w.*
If 28— 8— 4— 3— *qt.* 48— 6—3
4 16 4

Queſt. If my Family, conſiſtiug of 16 Perſons, do ſpend in 2 Years, 4 Months, 12 Chalders, 4 Bolls of Meal, what will ſerve (if I ſhould incline to augment their Number) 45 Perſons 3 Years? Thus.

Per. year. m. chal. bol. *per. year.*
If 16— 2— 4— 12— 4— *qt.* 45— 3
12 16 12

II. Example.

Queſt. What will ſerve theſe Regiments or Army (conſiſting of 42324 Men) to go againſt an Enemy for 4 Years, 6 Months, if an Army, or ſeveral Regiments of Men, conſiſting of 14328 took to maintain them when they went againſt their Enemy, 2478342 Pounds, 18 Shillings for 3 Years Space? Thus table it, as before directed.

Men, years, l. s. *men. year. m.*
If 14328—3—2478342—18 *qt.* 42324—4—6
36 12 20 54 12
85968 36 *m*·49566858 169196 54 *mo.*
42984 2285496 211620
515808 297401148 2285496
446101722
198267432
247834290
396534864
99133716
99133716 515808)

```
515808)113284855691568( 21962601·5
        1031616          ½ 10981300 : 15 s.
        -------                     l.
        1012325
         515808
        -------
         4965175
         4642272        Anſ. They will take
        --------
          3229036       10981300 l. 15 s. 3
          3094848       Pennies, 2 qrs. and 209952/515808
          -------
           1341889
           1031616
           -------
            3102731
            2094848
           --------
              788356
              515808
            --------
             2725488
             2579040
            --------
              146448
                  12
              ------
              292896
             146448
            --------
          ) 1757376 (3 d.
            1547424
            -------
             209952
                  4
            -------
          ) 1239808 (2 qrs.
            1031616
            -------
             208192 reſts
```

III. Example.

Queſt. I demand how much Ground 384 Moors will cut down in 4 Months, if 14 hereof cut down 324 Glebes, 2 Acres in 3 Months, 2 Weeks? Thus,

Moors,

```
     Moor. m.  w.  Glb.  ac.       Glb.   m.
If   14—3—2—324—2    qt.    384—4
     14     4         4              16     4
     56   14 w.  1298              2304   16 w.
     14          6144               384
    196          5192              6144
                 5192
                1298
                7788     4)
     196) 7974912 (40688(10172 Glbs.
          784
           1349
           1176
            1731
            1568
             1632
             1568
               64
               40  Roods in one Acre
     196)    2560 (13
             196
              600
              588
               12
                6  Ells in one Rood
               72  Parts
           of 196
```

Anſ. 384 Moors in 4 Months will cut down 10172 Glebes, 13 Roods, and $\frac{72}{196}$, as evident from the Work.

Queſt. Tell me how much 48 Maſons will build in 4 Months, 2 Weeks, if 16 Maſons build 384 Roods in 5 Months? Thus place it.

Maſ. m. rood. ma. m. w.
If 16—5—384—48—4—2
4 4

Queſt. If 16 Weavers in a Factory work 472 Ells, 3 Quarters of ſailing Cloath in 6 Months, 3 Weeks, what will 38 Weavers do (if I ſhould employ them) in 8 Months Time? Thus.

Wea. m. w. Ells, qrs. wea. m.
If 16—6—3—472—3 *qt.* 38—8
4 4 4

Intereſt of Money.

Queſt. Tell me the Intereſt of 732 Pounds, 14 Shillings, for 6 Years ¼, at 5 Pounds ½ *per Cent. per annum?*

l. year. l. s. s. year. m.
If 100——1—5—10—*qt.* 732 *l.* 14—6—3
20 12 20 20 12
2000 12 110 *s.* 14654 75 *mon.*
12 75
24000 73270
102578
1099050
110
10990500

10990500
1099050
24.000) 120895.500(503.7
120 ½ 251 : 17 s.
89 l.
72
175
168
7500
12
15000
7500
) 90.000 (3 d.
72
18000
4
) 72.000 (3 Quarters.
72

Anſ. 732 Pounds, 14 Shillings in 6 Years, 3 Months, at 5 and ½ *per Cent. per annum*, will come to 251 Pounds, 17 Shillings, 3 Pennies, 3 Quarters.

Queſt. Tell me the Intereſt of 100 Pounds for one Year, if 732 Pounds, 14 Shillings yeild me of Intereſt in 6 Years, 3 Months, 251 Pounds, 17 Shillings, 3 Pennies, 3 Quarters? Thus.

l. *s.* *y.* *m.* *l.* *s.* *d.* *qrs.* *l.* *y.*
If 732—14—6—3—251—17—3—3 *qt.* 100. 1
20 12 20 20.12
Queſt.

Queſt. Tell me the Intereſt of 2000 Pounds, 8 Shillings for 5 Years $\frac{1}{3}$, at 5 Pounds *per Cent. per annum?* Thus.

l. *year.* *l.* *l.* *s.* *year.* *m.*
If 100— 1—5— *qt.* 2000—8—5—4
20 12 20 12

Intereſt by various Acts of Parliament.

Queſt. Tell me the Intereſt of 648 Pounds, 12 Shillings for 8 Years, 4 Months, at 5 *per Cent. per annum* by Act of Parliament for 2 Years thereof: And at 5 and $\frac{1}{2}$ *per Cent. per annum* by Act foreſaid for 2 Years, 2 Months, and at 6 *per Cent. per annum* for 2 Years, 8 Months by Act foreſaid: And at 5 and $\frac{1}{2}$ *per Cent. per annum* by Act foreſaid for 1 Year, 6 Months.

Nota, Years happening to be at the ſame Intereſt the one with the other, you muſt add them together, and work them in one Operation, as you will ſee in the ſecond Operation, to wit, one at 5 and $\frac{1}{2}$ *per Cent. per annum* for 2 Years, 2 Months; and another at 5 and ^{1} *per Cent. per annum* for 1 Year, 6 Months. Now their Time being added together (as before directed) will be 3 Years, 8 Months for one Operation. See the Work it ſelf.

Lib. years, l. *l.* *s. years*
1ſt If 100— 1— 5— *qt.* 648— 12— 2
20 20
2000 12972
1 Year 2 Years
2.000 25944
5 *l.* Intereſt
2.000) 129.720 (64 *l.*
12
9
8
1720
20
) 34.400 (17 *s.*
2
14
14
400
12 *d.*
4.800 (2 *d.*
4
800
4 *qrs.*
3.200 (1 *qrs.*
2
1200
2000

1ſt Moiety's Int. is 64 Pounds, 17 Shillings, 2 Pennies, 1 Quarter.

2d. *Lib.* *years,* *l.* *l.* *s.* *year.* *m.*
If 100— 1—5—10— *qt.* 648.12—3—8
20 12 20 20 12
2000 12 110 *s.* 12972 44
12 44
24000 51888
51888
570768
110
5707680
570768
24.000)62784.480(261.6
48 ½130:16
147 *l.* *s.*
144
38
24
144
2d Moiety's Intereſt is 144
130 *l.* 16 *s.* 0 *d.* $\frac{23040}{24000}$
480
12
960
480
)5760(0 *d.*
4
)23040(0 *qrs.*

l. *years,* *l.* *l.* *s.* *year.* *m.*
3d If 100— 1—6— *qt.* 648:12—2—8
20 12

2000 12
12
24000

12972 32
32
25944
38916
415104
6
24.000) 2490.624 (103 *l.*
24
90
72
18624
20
) 372.480 (15 *s.*
24
132
120
12480
12
24960
12480
149760

) 149.760 (6 *d.*
144
5760
4
23.040 (0 *qrs.*
24000

l. *s.* *d.*
3d Mo. of Int. 103:15:6 $\frac{23040}{24000}$

l. *s.* *d.* *qrs.*
1ſt Moiety of Intereſt 64—17—02—1 $\frac{1200}{2009}$
2d Moiety of Intereſt 120 : 16 : 00 : 0 $\frac{23040}{24000}$
3d Moiety of Intereſt 103 : 15 : 06 : 0 $\frac{23040}{24000}$
Total Intereſt thereof 299 : 08 : 08 : 1

Anſ. the Intereſt of 648 Pounds, 12 Shillings in all for 8 Years, 4 Months will amount to 299 Pounds, 8 Shillings, 8 Pennies, 1

Quarter, equal to 100 Pounds, at 5. 5. ½, and 6 Pounds *per annum.*

Queſt. Tell me the Intereſt of 732 Pounds, 14 Shillings for 12 Years, at 5 and ½ *per Cent. per annum,* by Act of Parliament, for 3 Years thereof, and at 5 *per Cent. per annum* by Act foreſaid for 4 Years, and at 6 *per Cent. per annum* by Act foreſaid for 4 Years, 4 Months, and at 5 Pounds and ½ *per Cent. per annum* by Act foreſaid for 1 Year thereof? Thus table its Work.

l. years, l. s. l. years
1ſt If 100—1—5—10 *qt.* 732—14—4
20 20 20

l. years, l. l. s. years.
2d If 100—1—5 *qt.* 732—14—4
20 20

Nota, As you perform the firſt Example, ſo do the ſecond, as it is fairly tabled to you, as alſo all others of this Kind.

Intereſt bearing Intereſt.

Queſt. Tell me the Intereſt of 344 Pounds, 12 Shillings (Intereſt bearing Intereſt as well as Principal each Year) for 4 Years, at 5 Pounds *per Cent. per annum* each Year thereof?

Nota, To perform any Operation like this, you muſt firſt know the Intereſt of the principal Sum for the firſt Year thereof; and after that is known, you muſt add that Intereſt, (to wit) of the firſt Year to the principal Sum, and of their Total make your fourth Term for a ſecond Operation; and ſo go on, doing ſo with the ſecond Years Intereſt as with the firſt; as alſo with all the reſt, till you have finiſhed the Time propoſed, as clear from the Operation it ſelf.

l. *years,* *l.* *l.* *s.*
1ſt If 100—1—5 *qt.* 344—12—1
20 20
2000 6892
5
2.000) $\frac{1}{2}$ 34.460 (
l. 17.
460 remain
20
$\frac{1}{2}$.) 9.200 (
s. 4.1200 R.
12
$\frac{1}{2}$.) 14.400
d. 7. 4
1600 Parts
of 2000

	l.	*s.*	*d.*	*qrs.*	
The principal Sum is	344	12	00	00	
1ſt Years Intereſt of it is	17	04	07	0	$\frac{1600}{2000}$
Total of Prin. and Intr.	361	16	07	0	$\frac{1600}{2000}$

Table this Total for your ſecond Operation.

	l.	*year.*	*l.*	*l.*	*s.*	*d.*	*year.*
2d If	100—	1—5	*qt.*	361—	16	7	1

20
2000
12
24000 *d.*

20
7236
12
14479
7236
86839 *d.*
5
24.000) 434.195 (18 *l.*
24
194
192
2195
20
) 43.900 (1 *s.*
24
19900
12
39800
19900
) 238.800 (9 *d.*
216
22800
4
) 91.200 (3 *qrs.*
72
19200 Parts
of 24000

The

	l.	s.	d.	qrs.
The prin. Sum of the 2 Year is	361	16	7	0
The Int. of it being cumulate	18	01	9	3 $\frac{19200}{24000}$
Is of Prin. and Int. ſo cumulate	379	18	4	3

```
         l.  year. l.          l.      s.    d.  qrs. y.
3d If 100—1—5— qt.  379—18     4    3—1
          20             20
        2000           7598
          12             12
       24000           15200
           4           7598
       96000           91180
                           4
                      364723
                           5
         96.000) 1823.615 (18 l.
                 96
                 863
                 768
                  95615
                      20
               ) 1912.300 (19 s.
                 96
                 952
                 864
                  88300
                      12
                  176600
                  88300
                                 ) 1059.
```

) 1059.600 (11 d.
96
99
96
3600
4
14400 Parts
of 96000

l. s. d. qrs.
Prin. Sum of the 3d Year is 379 : 18 : 04 : 3
Intereſt of it being cumulate 18 : 19 : 11 : 0 $\frac{14400}{96000}$
Is of Prin.and An.ſo cumul. 398 : 18 : 03 : 3

l. year. l. l. s. d. qrs.
4th If 100—1—5 gt. 398 : 18 : 03—3—1
20 20
2000 7978
12 12
24000 15959
4 7978
96000 95739
4
382959
5
96.000) 1914.795 (19 l.
96
954
864
90795
20

```
   ) 1815.900 (18 s.
     96
     855
     768
      87900
         12
     175800
     87900
   ) 1054.800 (10 d.
     96
      94800
          4
   ) 379.200 (3 qrs.
     288
     91200 Parts.
  of 96000
```

	l.	s.	d.	qrs.
Prin. Sum of the 4th Year is	398 :	18 .	03 :	3
Annualrent of it cumulate	19 :	18 .	10 :	$3\frac{91200}{96000}$
Is of Prin. and Annual. for 4 Years, being cumulate with Principal each Year	418 :	17 :	02 :	$2\frac{91200}{96000}$

Queſt. Tell me the Intereſt of 218 Pounds for 3 Years (Intereſt bearing Intereſt as well as Principal each Year) at 6 Pounds *per Cent. per annum?* Perform the ſame as you ſee the former done, beginning thus.

	l.	*year.*	*l.*		*l.*	*year.*
If	100—	1—	6	*qt.*	218	—1

Single

Single FELLOWSHIP.

THis Rule may be ſo called, becauſe ſeveral Perſons enter into Company one with another, to trade with a certain Stock given in by them at firſt, without reſpect to any certain Time.

Nota, This Rule conſiſts of various Perſons, and various Stocks given in to trade with; ſo that according to their various Stocks given in at firſt, each Perſon may have his proper Share of either Loſs or Gain made by their trading in Company, and ſo by this it appears to conſiſt of Three Parts, *viz.* Perſons, Stock and Share.

Direction.

To table the ſame aright (in order to Operation) you muſt place each Man and his Stock below one another, according to their Entry, and after that is done, add them Stocks (given in) together, and of their Total make your firſt Term; and for a ſecond Term, let their Gain or Loſs made by their trading be the ſame: And for a third Term or *Demand*, take each Perſon's Stock given in at firſt. And ſo ſay by the Rule of Three direct, If their total Stocks yield ſo much Loſs or Gain, what will *A.* or *B.* or *C*'s Stock, one after another have therein? Obſerve, as before directed, if any of theſe Terms conſiſt of more Heads or Kinds than one, convert them into one Head or Kind, before you proceed to work the ſame.

To work the ſame (after it is thus tabled) obſerve the ſame Method with the *Rule of Three direct:* That is, multiply your ſecond Term Loſs or Gain, by your third Term, or each Man's particular Stock given in, and the Total of theſe two Terms divide by your firſt Term, or Total of theſe Perſons Stocks trading in Company together, obſerving whatever remains, or is in your Quote, will be of the ſame Kind with your ſecond Term, *Loſs* or *Gain.*

I. Example.

Queſt. *A. B. C.* entred into Company to trade together for *Loſs* and *Gain:* Into which Stock *A.* gave 318 Pounds, 14 Shillings, and *B.* gave 493 Pounds, 12 Shillings, and C. gave 632 Pounds, 8 Shillings: And at a convenient Time thereafter, meeting together for Clearance of Accounts, they found themſelves to have gained by their trading 2784 Pounds, 16 Shillings. Now I demand each Man's Share thereof, according to their Stocks given in at firſt for trading with.

l. *s* then ſay, *s.* *l.* *s.* *l.* *s.*
A—318—14 *l.*
B—493—12 *A.* If 1444.14-2784.16.*qt.*318.14
C.—632—08 20 20 20
*Tot.*1444—14 28894 55696 6374
6374

222784
389872
167088
334176

28894) 355006304 (1228.6
28894 ½ 614: 6
66066 *l.* *s.*
57788
82783
57788
249950
231152
187984
173364
14620
12 *d.* in one *s.*

28894) 175440 (6 *d.*
173364
2076
4 *Far.* in one *d*

8304 (Parts
of 28894

l. *s.* *d.* *qrs.*
A's Part is 614 : 06 : 06 : 0 $\frac{8304}{28894}$

l. *s.* *l.* *s.* *l.* *s.*
B. If 1444 : 14—2784 : 16 *qt.* 493 : 12
20 20 20
28894 55696 9872
9872

111392

111392
389872
445568
501264
28894) 549830912 (1902.9
28894 ½ 951.9
260890 *l.* *s.*
260046
84491
57788
267032
260046
6986
12
13972
6986
) 83832 (2 *d.*
57788
26044
4
) 104176 (3
86682
17494 Parts
of 28894

l. *s.* *d.* *qrs.*
B's Part is 951 : 09 : 02 : 3 $\frac{17404}{28894}$

l. *s.* *l.* *s.* *l.*
C If 1444 : 14 — 2784 : 16 *qt.* 632 : 08
20 20 20
28894 55696 12648
12648

```
               ------
                445568
               222784
              334176
             111392
             55696
           -----------
   28894) 704443008 ( 2438.0
          57788      ½ 1219.
          -------      l.  s.
          126563
          115576
          -------
           109870
            86682
           -------
            231880
            231152
            -------
               7288
                 12
              ------
              14576
              7288
            -------
            ) 87456 (3 d.
              86682
            -------
                774
                  4
               -----
               3096 Parts
              ------
              28894
```

C's Part is 1219 *l.* 0 *s.* 3 *d.* of $\frac{3096}{28894}$ Parts

Whole Share.

A's Share is 614 : 06 : 06 : 0— 8304
B's Share is 951 : 09 : 02 : 3—17494
C's Share is 1219 : 00 : 03 : 0— 3096
28894) Total 2784 : 16 : 00 : 0. (1

Ex-

Explication.

You ſee in this Example, *A.* is firſt ſet down, and his Sum, and then *B.* and his Sum, and then C. and his Sum: Then when all of them are added together, they amount to 1444 Pounds, 14 Shillings, which is my firſt Term, as before was told. Which 1444 Pounds I muſt convert to Shillings; and in multiplying thereof by 20, to take in my other Point, to wit, 14 Shillings to make them one Head or Kind, in order for Operation. This being done, I convert next my ſecond Term, their Gain into one Head or Kind, to wit, the 2784 Pounds (by multiplying thereof by 20) to take in the 16 Shillings, as you ſee done. Then I proceed to my third Term, to wit, firſt *A*'s Part and Stock, which is 318 Pounds, 14 Shillings; which 318 Pounds I muſt convert to Shillings, in order to take in my 14 Shillings, to make it one Head or Kind. This being done, to wit, all Terms being reduced, according to the Direction given, I take and multiply my ſecond Term, *viz.* my Gain by *A*'s Share in Stock given in by him, which I find to amount to 355006304 Shillings. This I divide by the firſt Term, their total Stocks, ſo converted to Shillings, *viz.* 28894 Shillings, and find it to caſt up to his Share 12286 Shillings, which being halfed comes to 614 Pounds, 6 Shillings. This being done, I proceed to convert the Remainder 14620 Shillings, to

Pennies; and after Diviſion thereof, I find him to have 6 Pennies alſo to his Share; the Remainder of which, *viz.* 2076 Pennies I convert to Farthings, and then I find his Share thereof to be nothing but a Fraction of 8304 Parts of the Diviſor 28894. And as it is with *A*'s Part and Stock, ſo it is with *B*'s and *C*'s, as to the Method of working. Laſt of all, when I have found out their Shares of that Gain, I ſet them down below one another, as I did their Stocks, and add them together, as you ſee done in the Example; asking how oft I will firſt get the Diviſor 28894 out of their remainder's Total, finding it once, I carry that one into my Farthings, and call it one Farthing, and ſo proceed as I do in Addition of whole and broken Numbers. And ſo finding the ſame Total of all their 3 Shares to agree with the total Gain, I conclude the Work to be right, and if otherwiſe, not right.

II. Example.

Queſt. A. B. C. D. four young Men entred into Company with one another for trading upon ſeveral Materials; into which Stock for trading, *A.* gave 209 Pounds, and *B.* gave 312 Pounds, 12 Shillings, and C. gave 208 Pounds, and *D.* gave 219 Pounds, 14 Shillings; and upon their trading they gained 798 Pounds, 14 Shillings, I demand their Share according to their Stocks given in?

Lib. *s.* *l.* *s* *l.* *l.*
A. 209 : 00 1ſt If 949 : 06—798 : 14 *qt.* 209
B. 312 : 12 20 20 20
C. 208 : 00 2d If 949 . 06 : 798 14 *qt.* 312 : 12
D. 219 : 14 20 20 20
Tot. 949 : 06 *l.* *l.* *s.*
3d If 949 : 06—798 : 14 *qt.* 208
20 20 20
4th If 949 : 06—798 : 14 *qt.* 219 : 14
20 20 20

III. Example.

Queſt. I demand what Share *A.* *D.* theſe two Perſons (having joined their Stocks together for trading) have in the Gain of 7324 Pounds, 18 Shillings, *A.* having given in of Stock 419 Pounds, 12 Shillings; and *D.* 738 Pounds, 08 Shillings? Thus.

l. *s.* ſay, *l.* *l.* *s.* *l.* *s.*
A. 419 : 12 *A.* If 1158—7324 : 18 *qt.* 419 : 12
D. 738 : 08 20 20 20
T. 1158 : 00

l. *l.* *s.* *l.* *s.*
D. If 1158—7324 : 18 *qt.* 738 : 8
20 20 20

IV. Example.

Queſt. There having entred into Company for trading upon ſeveral Goods theſe three Perſons, *viz.* *A.* for 917 Pounds, 12 Shillings, and *J.* for 473 Pounds, 8 Shillings, and *L.* for 417 Pounds, 14 Shillings: And upon their trading, they found themſelves to have gained with theſe Stocks 4732 Pounds? I demand their Shares?

	l.	*s.*
A.	917	12
J.	473	08
L.	417	14
Tot.	188	14

l. *s*. *l.* *l.* *s.*
A. If 1808 : 14—4732 *qt.* 917 : 12
20 20

l. *s.* *l.* *l.* *s.*
J. If 1808 : 14— 4732 *qt.* 473 : 8
20 20

l. *s.* *l.* *l.*
L. If 1808 : 14— 4732 *qt.* 417 : 14
20 20

Double FELLOWSHIP.

THis Rule teacheth us to know, that Perſons entring into Company one with another for trading, come under a double Relation one to another; which the foregoing Rule ties them noways up to; and that is both to Proportion of Stock, and Time for which ſuch a Stock is given in by them; ſo as by the Conſideration of their Stock, and Time they may have a proportional Share in Loſs or Gain made by their trading.

Nota, This Rule conſiſts of four eſſential Parts, *viz.* *Perſons*, their *Stock*, *Time* and *Share* or *Part* in *Loſs* or *Gain* made by them in trading; and ſo differs from the foregoing *Single Rule of Fellowſhip*; becauſe it hath regard to both Stock and Time: Whereas *Single* has only regard to Stock given in by certain Perſons without Time. Having thus far prepared the Work, I proceed next to ſhow you how to table the ſame.

Direction.

To table the ſame, take this following Method, *Firſt*, Multiply each *Perſon's Stock* by his *Time* for which it was given in; only before you do the ſame, take care that your *Stock Total* be of one Head or Kind, as alſo the Time. Then when all the *Perſons Stocks* are multiplied by their *Time*, place them next, to wit, their *Total* of *Stock* and *Time* below one another, as you did the foregoing Rule, and then add them together, of whoſe Total make your Diviſor; and let your *Loſs* or *Gain* (being converted to one Head or Kind) be your ſecond Term in order; and for a third Term or *Demand*, let each Perſon's *Total* of *Stock*, and *Time* therein concerned, be the ſame one after another, ſo many thereof as you have trading in Company; obſerving, as directed in the *Rule of Three direct*, that your firſt and third Terms be of one Kind, and the ſecond Term what the *Demand* requires, conſidering whatever remains, or is in your Quote, is, and will be of the ſame Kind with your ſecond Term. Having this far traced its tabling, work it as you did the *Rule of Three direct*. Then,

To work the ſame, multiply the Total of your ſecond Term, *Loſs* or *Gain*, by your third Term *Demand*, or Total of each Perſon's *Stock*, and *Time*, Perſon after Perſon: And the Total of theſe two Terms divide by your firſt Term's Total, or Total of both *Stock* and *Time* of all the Perſons concerned. Now I proceed to an Example thereof.

I. Example.

Queſt. *A*. *B*. C. theſe three Perſons went to trade together into Company for ſome Time, into which *Stock* for trading *A*. gave 112 Pounds for 4 Years, 4 Months, and *B*. gave 219 Pounds, 10 Shillings for 5 Years, and C. gave 174 Pounds, 4 Shillings for 6 Years, 2 Months; and at length they gained upon trading 3254 Pounds, 14 Shillings: Now I demand their *Shares* thereof, according to their different *Stocks* and *Time*. Let the Work ſtand thus.

	l.	*y.*	*m.*		*l.*	*s.*	*y.*		*l.*	*s.*	*y.*	*m.*
A.	112	4	4	*B*.	219	10	5	C.	174	4	6	2
	20	12			20		12		20		12	
	2240	52			4390		60		3484.		74	
	52				60				74			
	4480			*B*'s	263400				13936			
	11200								24388			
A's	116480								257816			

Then place them thus.

A's Total is—116480
B's Total is—263400
C's Total is—257816
Total of all—637696

Then ſay, as before directed.

Per. Total, l. s. gain, A's Total
A. If 637696— 3254:14 *qt.* 116480
20
65094
116480
5207520
260376
390564
65094
65094
637696) 7582149120 (1188.9
637696
1205189
627696
5674931
5101568
5733632
5101568
6320640
5739264
581376
12
1162752
581376
) 6976512

½594 : 9
l. *s.*

) 6976512 (10 *d.*
637696
599552
4
) 2398208 (3 *qrs.*
1913088
485120 Parts
of 637696

l. *s.* *d.* *qrs.*
A's Part will be 594 : 09 : 10 : $3\frac{485120}{637696}$

Per. *Total,* *l.* *s.* *B*'s *Total*
B. If 637696— 3254 : 14 *qt.* 263400
20
65094
263400
26037600
195282
390564
130188
637696) 17145759600 (2688.7
$\frac{1}{2}$ 1344 : 7
1275392
4391839
3826176
5656636
5101568
5550680
5101568
4491120
4463872

27248

27248
12
54496
27248
) 326976 (0 *d.*
4
) 1307904 (2
1275392
32512 Parts
of 637696
B's Part is— 1344 : 07 : 00 : 2 $\frac{32512}{637696}$

Per. Total, *l.* *s.* *C's Total*
C's If 637696— 3254 : 14 *qt.* 257816
20
65094
257816
390564
65094
520752
455658
325470
130188
637696) 16782274704 (2631.7
1275392 ½ 1315 : 17
4028354 *l.* *s.*
3826176
2021787
1913088
1086990
637696

```
      4492944
      4463872
      -------
        29072
           12
      -------
        58144
       29072
      -------
     ) 348864  (0 d.
            4  (
      -------
     ) 1395456 (2 qrs.
     ) 1275392
      -------
       120064 Parts
   of  637696
```

         l.   s.   d. qrs.
C's Part is 1315 : 17 : 00 : 2 120067

l. s. d. qrs.
A's Sh. for Stock and T. is 594:09:10:3-485120
B's Sh. for Stock and T. is 1344:07:00:2--32512
C's Sh. for Stock and T. is 1315:17:00:2-120064
Tot. of Sh. equal to Gain 3254:14:00.0--637696

Explication.

You ſee in the beginning of this Operation, *A*'s *Stock* and *Time* is 112 Pounds for 4 Years, 4 Months; which Pounds in Stock I was obliged to convert to Shillings, and his Time to Months, in order to make his Proportion agreeable to *B*'s and *C*s Proportion in the ſame Kind and Denomination, each one agreeing with another. After this is done, I find *A*'s Total of *Stock* and *Time* to amount to the

Pro-

Product of 116480, and *B*'s Total of *Stock* and *Time* to amount to the Product of 263400, and *C*s Total of *Stock* and *Time* to amount to the Product of 257816. Which three Products I take and place them below one another, as directed; and being added, they will amount to in all for a common Diviſor, or firſt Term 937696, as clear from the Work it ſelf. Then I proceed, as before directed, and multiply my Gain 3254 Pounds, 14 Pennies, after converted to Shillings by *A*'s Total of *Stock* and *Time*, and I find the total Product ariſing therefrom to be 7582149120, as the common Dividend to be divided by the common Diviſor 637696, the Total of their whole *Stocks* and *Time*, and thereby finiſhing the ſame in the common Way, I find *A*'s Part of that Gain to be 594 Pounds, 9 Shillings, 10 Pennies, 3 Quarters, and one Fraction of 485120 remaining, as ſuch a Part of the Diviſor 637696; which is placed ſo for Anſwer under the Operation it ſelf. And having found out *A*'s Share of that Gain, I next proceed to *B*'s, and then to *C*s, and perform them the ſame Way and Manner: Then finding their Shares alſo, I ſubſume them all in the Cloſe of the Operation, (as you ſee done) and then I find, when their Shares are added together, with their Fractions; out of which I find the Diviſor once, which I carry to the Farthings, and ſo proceed as in common Addition, finding thereby their Share exactly to agree with the Total of Gain made by them, and ſo conclude the Operation to be right, and if it fell out otherwiſe, it would not be right. Obſerve this Method with all the other Examples following, or any other, as they may occur belonging to this Rule.

II. Example.

Queſt. *A. B.* and *C.* theſe three Perſons gave in the *Stocks* following, for trading together for a certain *Time*, as follows, *viz.* *A* gave 98 Pounds for 6 Years, and *B.* gave 49 Pounds for 8 Years, and *C.* gave 78 Ponnds, 8 Shillings for 9 Years: And upon theſe *Stocks*, and in that *Time* they found themſelves to have gained 4324 Pounds, 16 Shillings. I demand their *Shares* thereof, according to the *Stock* and Time given in? Let your Work ſtand thus as below.

l. *y.*	*l.* *y.*	*l.* *s.* *y.*
A. 98 : 6	*B.* 49 : 8	*C.* 78 : 8 : 9
20	20	20
1960	980	1568
6	8	9 Years
Tot. 11760	Total 7840	Total 14112

A's Total is 11760
B's Total is 7840
C's Total is 14112
Their Total is 33712 for a common Diviſor.

III. Example.

Queſt. Theſe two *Perſons* went to trade together for a certain *Time*, *viz.* *A.* for 4 Years, 2 Months, and gave in of *Stock* 58 Pounds, 5 Shillings thereto, and *B.* for 6 Years, gave in of *Stock* 93 Pounds; and upon trading together, they found themſelves to have gained 973 Pounds, 9 Shillings, 6 Pennies? I demand their Share thereof? Thus, as before.

l. *s.* *y.* *m.* *l.* *y.*
A. 58 : 5 — 4 : 2 *B.* 93 : 6
20 12 . 20 12
1165 50 1860 72
A's Tot. is 58250 50 *Time* 72 *Tim.*
B's Tot. is 133920 58250 3720
Total is 192170 for a Diviſor 13020
Say, Total *l.* *s.* *d* *A*'s Total 133920
If 192170 — 973 : 9:6 *qt.* 58250

IV. Example.

Queſt. Let it be demanded what will be the Share of *A. D. M.* in the Loſs of 2738 Pounds, 4 Shillings, *A.* having given in to the common Stock 248 Pounds, 18 Shillings for 4 Years. And *D.* 381 Pounds, for 8 Years: And *M.* 408 Pounds, 8 Shillings for 7 Years, 3 Months? Let the Work ſtand thus.

l. *s.* *y.* *l.* *y.* *l.* *s.* *y.m.*
A. 248 : 18 : 4 *D.* 381 : 8 : *M.* 408 : 8 : 7
20 12 20 12 20 12

4978 : 48	7620 : 96	8168 : 87
48	96 Time	87
39824	45720	57176
19912	68580	65344
238944	731520	710616

A's Total is 238944
D's Total is 731520
M's Total is 710616

l. s.
Then ſay, If 1681080—2738 : 4 *qt.* 238944
20

ALLIGATION MEDIAL.

THis Rule teacheth us to alligate Compound, or mix together many *Simples* of various Kinds, in order to expoſe them to Sale, without any Loſs to Perſons willing to buy them.

Nota, This Rule conſiſts of five eſſential Parts, *viz.* of various *Simples*; of various *Prices*, of total *Simples* given, and their total *Price*: And of an equal *medium*, (as to the Price of one of thoſe) demanded, in order to expoſe them to the Buyer in Sale, without any Loſs to him who expoſes them.

Direction.

To ſtate, or table this Rule aright for Operation, take this Method; *Firſt*, Set down your various *Simples*, with their various *Prices*, each of them one below another, as you did the *Perſons* and their *Stocks* in *ſingle Fellowſhip*. Then multiply each *Simple* (one after another) by their *Price* ſo given: And then, when its total *Price* is found, place it ſtraight in the ſame Line with the Quantity of *Simples* given. When all are done, and known, as to their full or total Prices, add up your *Simples* firſt, and ſet down their *Total* or *Product* below them. Then proceed to their various total *Prices*, and add them together, and their Total place below their various total *Prices* When all this is done, ſay by the *Rule of Three direct*, (that uſeful Rule,) If theſe total *Simples* given yield me ſuch a Price as their total *Prices*, what will one thereof give me, in order to expoſe to Sale? So that it is clear, that your total *Simples* will be your firſt *Term* or *Suppoſition*, and your total *Price* will be your *ſecond Term*. And to know what the Price of one will be, will be your *Demand*, or third Term. Having this far directed you how to table it, I proceed next to ſhow you how to work the ſame.

To work the ſame then, multiply your ſecond *Term* by the third *Term*, and their Product divide by the firſt *Term*'s Product; and if it cannot be got, you muſt proceed, and convert it to the next Kind, as clear from the Work following: Or you may divide immediately (if it can be got) the ſecond Term, or total *Price* of theſe *Simples*, by the total *Simples*; for as one *Simple* is to one *Simple*'s Price, ſo are the total *Simples* to their total *Price*.

I. Example.

Queſt. A certain Merchant having various Kinds of Goods by him, at various Prices, and being to give up his Shop, he deſires to know what he may ſell them at overhead (bad with good) to the Merchant willing to take his Shop and Goods off his Hand, *viz.* he hath 14 Pounds of Currans, at 5 Shillings *per* Pound, and 18 Pounds of Sugar-candy at 14 Shillings *per* Pound, and 28 Pounds of Candy Broad Sugar at 10 Shillings *per* Pound, and 12 Pounds of Prunes at 5 Shillings *per* Pound, and 19 Pounds of Rice at 13 Shilling *per* Pound. See the Work.

	l.		*l.*	*s.*	*d.*
Currans ——	14	at 5 *s. per l.* is	03	10	00
Sugar-candy	18	at 14 *s. per l.* is	12	12	00
Candy broad	28	at 10 *s. per l.* is	14	00	00
Prunes ——	12	at 5 *s. per l.* is	03	00	00
Rice ———	19	at 13 *s. per l.* is	12	07	00
Total Pounds	91	Total Price	45	09	00

l. *l.* *s.*
Then ſay, If 91—45 : 9 *qt.* 1 ſee the Work

l. *l.* *s.* *l.*
If 91—— 45 : 9 *qt.* 1
20

91)

91) 909 (9 *s.*
819
90
12
180
90
) 1080 (11 *d.*
91
170
91
79
4
) 316 (3 *qrs.*
273
43 Parts
of 91

Anſ. He muſt ſell them overhead (that he may be no Loſer) at 9 *s.* 11. *d.* 3 *qrs.* and $\frac{43}{91}$ Parts

To prove that this is the Price he muſt ſell them at overhead, *viz.* 9 *s.* 11 *d.* 3 *qrs.* and $\frac{43}{91}$, ſee the Work below, ſaying thus.

l. *s.* *d.* *qrs.* *l.*
If 1——9 : 11 : 3 $\frac{43}{91}$ Parts, *qt.* 91
12
119
4
479
91
479
43113 Fraction
4 12)

```
  ______
4) 43632 (10908( 90.9
   4      108   ½45 : 9 s.
   __     ____
    36      108    l.
    36      208
    ___     ___
     32
     32
    ___
```

Nota, You ſee plainly from the Work, that the *Price* he muſt ſell them at overhead, muſt be at 9 Shillings, 11 Pennies, 3 Quarters, and $\frac{43}{91}$ Parts; for it is evident that one *Simple* at 9 Shillings, 11 Quarters, $\frac{43}{91}$, are as equal to one another, as 91 Pounds are to 45 Pounds, 9 Shillings.

Explication.

You ſee that theſe *Simples*, *viz.* 14 Pounds Currans, at 5 Shillings *per* Pound is in total *Price* 3 Pounds, 10 Shillings; and theſe *Simples* 18 Pounds Sugar-candy at 14 Shillings *per* Pound, is in Total *Price* 12 Pounds, 12 Shillings, and theſe *Simples* 28 Pounds of Candy broad at 10 Shillings *per* Pound, is in total *Price* 14 Pounds, and theſe *Simples*, 12 Pounds of Prunes, at 5 Shillings *per* Pound, is in total *Price* 3 Pounds. And theſe *Simples* 19 Pounds of Rice at 13 Shillings *per* Pound, is in total *Price* (being multiplied by the *Price* of one, *viz.* 13 Shillings) 12 Pounds, 7 Shillings. And when all the *Simples* are added to one another, their total *Product* is found to amount to 91 Pounds in *Number*. And when all their ſeveral total

Prices are added together, their total Product will be found to amount to 45 Pounds, 9 Shillings. Then having found out the total *Simples*, and their total *Prices*, as above-expreſt, I take their total *Prices*, and convert them to Shillings, to take in my 9 Shillings; and when ſo done, I find their total Shillings in *Price* will amount to 909 Shillings. And becauſe it cannot be made greater in Number, by multiplying thereof by my third *Term* 1, I immediately divide theſe 909 Shillings by my 91 Pounds, and then I find 9 Shillings to be placed in the Quote: And ſo go on, converting the Remainder to Pennies, *viz.* 90, and of it I find 11 Pennies, converting the Remainder of them Pennies, *viz.* 79 Pennies to Farthings; I find 3 Farthings for the Quote, and 43 remaining, as a Fraction of the 91 Pounds. Now, to prove that this is the ſelling *Price* of one, *viz.* 9 Shillings, 11 Pennies, 3 Quarters, and $\frac{43}{91}$ Parts, I proceed thus, ſaying, If one Pound yield me 9 Shillings, 11 Pennies, 3 Quarters, aud $\frac{43}{91}$ Parts, what will 91 Pounds yield me of *Price*? Now you ſee I muſt convert theſe 9 Shillings to Pennies, to take in my 11; which being done, by multiplying thereof by 12 the Pennies in one Shilling, I find the Product will be 119 Pennies. Now theſe I muſt convert to Farthings, by multiplying thereof by 4 the Farthings in one Penny, and I find the Product will be 479 Farthings;

which 479 Farthings I multiply by the 91 Pounds the *Demand*, and then I find their Product (by adding the 43 of a Fraction thereto) to amount to 43632 Farthings. Which Sum of Farthings I divide by 4, to convert them to Pennies, and I find the Quote to be 10908 Pennies: Which Pennies I divide by 12, to convert them to Shillings, and I find the Quote thereof to be 909 Shillings; which Shillings being halfed, after cutting off a Figure upon the right Hand, will amount to 45 Pounds, 9 Shillings, without any Remainder. Now, as this Example is clearly wrought and explained, ſo may you perform theſe following Examples tabled to you, but not performed, thinking it more meet to leave them for Examples to be tried by your ſelf.

II. Example.

Queſt. A Farmer having theſe Quantities of Victual by him, deſires to know how he muſt ſell them overhead *per* Boll, ſo as he may be at no Loſs? *viz.*

			l.	*s.*	*d.*
Oats—	32	Bolls, at 6 *l. per* Boll, is	192	00	00
Barley	28	Bolls, at 8 *l. per* Boll, is	224	00	00
Rye—	12	Bolls, at 4 *l.* 4 *s. p.*B. is	050	00	00
Wheat	18	Bolls, at 9 *l. per* Boll, is	162	00	00
Simp. is	90	*Total Price*	628	08	00
			l.	*s.*	*d.*

III. Example.

Queſt. A Baxter having various Quantities and Qualities of Bread by him, deſires to know how he muſt ſell them overhead, ſo as he may be no Loſer thereby with the Buyer? *viz.*

			l.	*s.*	*d.*
Wheat Loaves	98	at 12 *s. per* Loaf, is	58	16	00
Wheat Loaves	28	at 6 *s. per* Loaf, is	08	08	00
Wheat Loaves	18	at 4 *s. per* Loaf, is	03	12	00
Brown Loaves	42	at 5 *s. per* Loaf, is	10	10	00
Rye Bread—	14	at 4 *s.* 6 *d. p.* L. is	03	03	00
Total Simples	200	*Total Price*	84	09	00

Loaves. *l.* *s.* *Loaf.*
If 200——84 : 09 *qt.* 1

IV. Example.

Queſt A Merchant having various Kinds, and different Quantities of Cloath by him, having an Opportunity of putting them to Sale, (unto another Merchant) deſires what he muſt ſell it at *per* Ell? *viz.*

			l.	*s.*
Broad Clo.	78 Ells,	at 8 *l.* 12 *s. p* Ell, is	670	16
Drogats—	28 Ells,	at 2 *l.* 4 *s. p.* Ell, is	061	12
Silks ——	92 Ells,	at 3 *l.* 4 *s. per* Ell, is	294	08
Sarge ——	48 Ells,	at 14 *s. per* Ell, is	033	12
Tot. Simp.	246	*Total Price*	1060	08

Ells, *l.* *s.* *Ell*
Then ſay, If 246——1060 : 8 *qt.* 1.

V. Example.

Queſt. A Goldſmith having different Quantities and Qualities of Gold and Silver by him, deſires to know what to ſell them at *per* Ounce? *viz.*

	Ounces,		*l.*	*s.*
Of Gold—	28	at 36 *l. per* Ounce, is	1008	00
Of another	14	at 35 *l. per* Ounce, is	0490	00
Of Silver	29	at 4 *l.* 4 *s. p.* Ounce, is	0121	16
Tot. Simp.	71	*Total Price*	1619	16

VI. Example.

Queſt. A Shoemaker having ſome Shoes by him of various Sizes, deſires to know what to ſell them at *per* Pair? *viz.*

			l.	*s.*	*d.*
Pairs, Men—	28	at 2 *l.* 14 *s. p.* Pair, is	75	12	00
Pairs, Women	22	at 1 *l.* 12 *s. p.* Pair, is	35	04	00
Pairs, Childr.	18	at 18 *s. per* Pair, is	16	04	00
Tot. Simples	68	*Tot. Price*	127	80	00

Alligation Alternate

THis Rule teacheth us to alligate or link together different ſuppoſed Rates of Sale, in order to know the diſtinct and true Compoſition of Quantities and Qualities, without Loſs thereby.

Nota, This Rule conſiſts of ſix eſſential *Parts, viz.* firſt of the various *ſelling Prices* of *Simples*; ſecond is the *ſelling Price* the Merchant (ſo expoſing them) is willing to ſell them at, without Loſs thereupon. The third is the *Quantity* of *Differences* that are found therein. Fourth, the *Quantity* to be *mixt* or *ſold.* Fifth, the *Quantity* of each *Sort* or *Kind* thereof. The laſt is the Probation of the Reality of theſe *Mixtures,* without Loſs.

Direction.

You muſt firſt conſider the various common *ſelling Prices,* and place them below one another ſtraight up and down, putting a Draught up and down before them upon the left Hand. Oppoſite to the middle of ſuch a Draught ſo drawn, place the P*rice* the Merchant is willing to ſell ſuch a *Mixture* at. After theſe are done, link or couple the leſſer Prices ſo given to the greater, and then conſider the Difference between the common *ſelling* P*rices* ſo given, and the propoſed P*rice* upon the left Hand thereof, which the Merchant propoſes to ſell them at, putting the Difference between the propoſed *ſelling* P*rice,* and the leſſer common P*rice* given, oppoſite to the greater to which it is coupled; and the Difference between the propoſed *ſelling* P*rice,* and the greater common P*rice* oppoſite to the leſſer, to which it is linked; and ſo on, Difference between leſſer and the propoſed *ſelling* P*rice* oppoſite to greater, and greater oppoſite to leſſer, till you have finiſhed what you intend by it.

Then after all this is done, having found out your various Differences, add them one to another, of whoſe *Total* make your firſt *Time* or *Suppoſition:* And let the Quantity he (to wit, the Merchant) intends to ſell at ſuch a propoſed *Price*, be your ſecond *Term*: And for a third Term, let the *Differences* between common *ſelling Price* given, and propoſed *ſelling Price* be the ſame. So ſaying, by the *Rule of Three direct*, If ſo many *Differences* as their Totals are, yield me ſo many of ſuch a *Mixture*, what will ſuch a *Difference* (one after another, for ſo many as you have) yield me for *Mixture?* See the Work it ſelf.

Queſt. A Merchant having ſeveral Kinds of Cloath beſide him, *viz.* ſome at 12 Shillings *per* Ell, and at 13 Shillings *per* Ell, ſome at 16 Shillings *per* Ell, ſome at 17 Shillings *per* Ell; is deſirous to ſell 118 Ells thereof, at 9 Shillings *per* Ell? Now the *Demand* is, What Quantity of each Sort muſt he take to make up theſe Quantities of 118 Ells to be ſold by him? Table it thus.

	Common Price.	*Difference.*
Propoſed Price 9	12	— 8
	13	— 7
	16	— 4
	17	— 3
		22

For as the whole *Difference* is to the whole *Quantity*, ſo is each particular *Difference*, to each particular calculated Part thereof to be ſold. Thus.

Then ſay, *Parts of Difference*
Differ. *Ells,* *Parts* *Ells, Fract.*
If 22——118—*qt.* 8—is 42—20 of 12 *s. Cl.*
8
22) 944 (42
R. 20 *Ells, Fract.*
If 22—118—*qt.* 7.—is 37. 12 of 13 *s. Cloath*
7
22) 826 (37
R. 12 *Ells, Fract.*
If 22 118—*qt.* 4. is 21—10 of 16 *s. Cloath*
4
22) 472 (21
R. 10 *Ells, Fract.*
If 22— 118—*qt.* 3. is 16— 2 of 17 *s. Cloath*
3
22) 354 (16 *Ells,* 118) 44 (2
R. 2 *propoſed* 44

Anſ. I muſt take 42 Ells, and $\frac{20}{22}$ Parts of the 12 Shillings Cloath, and 37 Ells and $\frac{12}{22}$ Parts of the 13 Shillings Cloath, and 21 Ells and $\frac{10}{22}$ Parts of the 16 Shillings Cloath, and 16 Ells and $\frac{2}{22}$ Parts of the 17 Shillings Cloath to make up the Number of Ells ſought, *viz.* 118 Ells, to be ſold at 9 Shillings *per* Ell.

Explication.

I firſt take (as before directed) my *Sale Prices* given, *viz.* 12, 13, 16, and 17, and place them under other, according to their *Value* or *Place*; and after that is done, I take my *Price* that I propoſed to ſell them at, *viz.* 9 Shillings, and place it in the middle of the Draught before theſe *Sale Prices.* Then I ask the Difference between 9 the propoſed *ſelling Price*, and 12 the *Sale Price*, and I find it to be 3 of Difference; which 3 I place oppoſite to the 17 to which it is coupled; having finiſhed that Part, I proceed next and ask the Difference between 9 and 13, and I find it to be 4; which 4 I place oppoſite to the 16, the greater to which it is coupled: Then I ask the Difference between 9 and 16, which I find to be 7; which 7 I place oppoſite to 13 the leſſer to which it is coupled. Then I ask the Difference between 9 and 17, which I find to be 8; which 8 I place oppoſite to 12 the leſſer to which it is coupled. Having finiſhed that Point required, of knowing their *Differences*, I proceed next to make a Total of theſe *Differences* found, and I find them to extend to 22 in whole, as clear from the Work it ſelf; for when 3, 4, 7, 8 are added together, their Total will be 22. The next Thing that falls in, is to know the Number of Ells to be given off, of each Sort to be ſold at 9 Shillings *per* Ell; and this I do by the *Rule of Three direct*, as before directed, ſaying, (one after another) If 22 the total *Differences* yield me ſuch a Thing as 118 Ells to be ſold at 9 Shillings, what will 8 the firſt *Difference* yield me therein of Ells, at 12 Shillings *per* Ell. This I do, multiplying the 118

Ells propoſed by 8 the *Difference*, and I find them to amount to of Product 944; which Total I divide by 22 the total *Differences*, and I find the Quote to produce 42 Ells, and $\frac{20}{22}$ Parts for that Sort of Cloath at 12 Shillings *per* Ell. Then I proceed to the next, and multiply the 118 Ells by 7 the next *Difference*, and the Total thereof is 826; which being divided by 22 the total *Differences*, I find the Quote to be 37 Ells and $\frac{12}{22}$ Parts for that Cloath at 13 Shillings *per* Ell. Then I proceed, and multiply the 118 Ells propoſed by 4 the next *Difference*, and the Total thereof I find to be 472; which being divided by 22 the total *Differences*, I find the Quote to be 21 Ells and $\frac{10}{22}$ Parts of that Cloath at 16 Shillings *per* Ell. Then I proceed, and multiply again my 118 propoſed by 3 the next *Difference*, and the Total thereof I find to be 354; which being divided by the 22 the total *Differences*, I find the Quote to be 16 Ells and $\frac{2}{22}$ Parts of Cloath at 17 Shillings *per* Ell. Having finiſhed that Part required, I next proceed to add thoſe Ells of different Sorts and their Fractions together, to make a Total of them, beginning thus with their Fractions, *viz.* adding 2, 10, 12 and 20 together, and their Total is 44, out of which I get the Diviſor 22 (the total *Differences*) 2 Times; which 2 I carry to my Ells, *viz.* 16, 21, 37 and 42, and when added together, I find them to amount to the Total propoſed to be ſold at 9 Shillings *per* Ell, *viz.* 118 Ells in whole deſigned by the Merchant.

Now the laſt Thing required, is, to prove the ſame; and to do it, take this Method following, Multiply the whole Quantities propoſed to be *mixt* or *ſold* by the common *Price* he deſigns to ſell them at *per* Piece, as Example, multiply the 118 Ells by the *Price* propoſed to ſell them at *per* Ell, *viz.* 9 Shillings, and their Product will be 1062. Then multiply all the particular Quantities of Ells, or other Things by their *ſelling Price*; and if the Totals of all thoſe (when added) agree with the former Sum, *viz.* the given *Number* to be *ſold* or *mixt*, being multiplied by the *Price* it is to be ſold at, according to the Merchant's Propoſal, your Work will be right, otherwiſe not; a Probation of which when you multiply firſt 42 Ells, $\frac{20}{22}$ Parts by 12, and 37 Ells, $\frac{12}{22}$ Parts by 13 and 21 Ells, $\frac{10}{22}$ Parts by 16, and 16 Ells, $\frac{2}{22}$ Parts by 17, their Total will be equal to 1062 as above, ſo your Work I conclude to be right.

II. Example.

Queſt. A Vintner having by him of Wine, *viz.* *Canary* at 14 Shillings *per* Gallon, *Rheniſh* at 10 Shillings *per* Gallon, *Malaga* at 6 Shillings *per* Gallon, and White Wine at 2 Shillings *per* Gallon, deſiring to make a Compoſition of 80 Gallons thereof at 7 Shillings *per* Gallon, I deſire to know how much of each Sort he muſt take, to make up this Compoſition of 80 Gallons, ſo as he may be no Loſer thereby ?

Nota, There is but one Branch of the given *Prices* leſſer than the Root, or propoſed *Sale Price*, and therefore all the reſt of given *Prices* muſt be linked to it: So that it is evident, That leſſer *Price* muſt anſwer in *Difference* to all the reſt of the *Prices*, and they unto it, as clear from the Work. Thus.

Common	Price,	*Diff.*	*Differ.*
Pro. 7	14	5	5
	10	5	5
	6	5	5
	2	7, 3, 1,	11
			26

Having found it out ſo to be, ſay, as in the former Example, If 26 the total *Difference* yield me 80 of total *Mixture*, what 5 the firſt *Difference*? As with theſe, ſo with all others of this Rule.

MENSURATION of SQUARES

THis Rule is called, *Menſuration*, becauſe i allows of *Meaſure* to be made thereof: I is called, *Square*, becauſe it allows of two equa Sides, *viz.* *Breadth* and *Length*.

Nota, This Rule, you ſee, (as to the Natur of it) conſiſts of three principal Parts, *viz* *Length*, *Breadth*, and *total Product*, either i

In

Integers, or *Integers* and *Fractions*, a 4th might be added, *viz.* the Price of the given *Meaſure*, according to Agreement made.

Direction.

To ſquare any Thing, whether it be in reſpect to *Ells* or *Feet*, ſo as to know its Contents upon the *Superficies*, you muſt multiply your *Length* (ſo found out) by your *Breadth*, and the *total* Product thereof will be your *Ells*, *Quarters*, *Nails*, *ſquare*, or *Feet Inches ſquare*: But before you proceed to multiply your *Length* by *Breadth*, conſider, (as often before directed) That your *Length* and *Breadth* be of one *Kind* or *Quality*: Having ſo done, as directed, proceed to the Work. To know the *Product* of an *ſquare* Ell, I give you the following Examgle.

I. Example Explicatory.

Queſt. Tell me how many Napkins of Quarter *Length* and *Breadth* I will have in a Piece of Holland, whoſe *Length* is 1 Ell, and *Breadth* 1 Ell? Conſider, that in one plain Ell there are 4 Quarters, ſo that I muſt multiply 4 Quarters the Contents of one Ell's *Length*, by 4 Quarters the Contents of one Ell's *Breadth*, in order to ſhow the *Product* of *ſquare* Quarters required.

	qrs.
Length	4
Breadth	4
Square	16 *qrs.*

Anſ. There will be of Napkins therein, according to my *Demand* 16, as the Work it ſelf ſhews you.

Nota, When you are required to reduce *ſquare* Quarters to Ells, you muſt divide theſe Quarters ſo given by 16 the Quarters in one *ſquare* Ell, and the *Quote* thereof will be your Ells *ſquare*, and what remains will be a Fraction, or ſuch a Part of that *ſquare* Ell.

II. Example Explicatory.

Queſt. Tell me the *Inches* in a Foot *ſquare*? Multiply 12 by it ſelf the *Inches* in one Foot, and the P*roduct* thereof will be your *Inches* therein contained. Thus,

L. One Foot, 12 Inches
B. One Foot, 12
Inches— 144 in one *ſquare* Foot.

Anſ. In one Foot *ſquare* there are 144 *Inches*, which 144 *Inches* will be your Diviſor, when you are called to reduce any Number of *Inches* to Ells *ſquare*. All which above you will ſee clearly made out in one of the following Examples.

I. Example practical.

Queſt. Tell me the *ſquare* Ells in theſe 3 Rooms that were plaſtered by the Workman, whoſe Wages being 6 Shillings for each *ſquare* Ell therein contained, *viz.* the firſt Room was in *Length* 12 Ells, and in *Breadth* 8 Ells; the ſecond Room was 18 Ells *Length*, and 12 Ells *Breadth*,

Breadth; the third Room was 12 Ells *Length*, and 6 Ells 3 Quarters *Breadth*? Thus.

1ſt Room,	*2d Room,*	*3d Room,*	*El. qr.*
Ells,	*Ells,*	*L.* 12 Ells,	*B.* 6 : 3
L. 12	*L.* 18	4	4
B 8	*B.* 12	48	27
Ells 96 *ſquare*	36	27	
	18	336	
	Ells 216 *ſq.*	96	
		16) 1296 (81 Ells *ſqr.*	
		128	
		16	
		16	

Then place it thus,
Ells,
1ſt Room's *Product* 96
2d Room's *Product* 216
3d Room's *Product* 81
Total of *ſquare* Ells 393 being
multiplied by 6 the Price of 1 *ſqr.* Ell
is 2358 *s.*
½ 117 : 18
l. *s.*

Anſ. In theſe 3 Rooms there are 393 *ſquare* Ells, and the Workman is to have therefore 117 Pounds, 18 Shillings.

II. Example.

Queſt. Tell me the *ſquare* Feet in that Pavement, whoſe *Length* is 42 Feet, 3 Inches, and *Breadth* 26 Feet, 4 Inches, at 8 Shillings *per ſquare* Foot.

Feet,

	Feet, Inch.		*Feet, Inch.*
Length	42—3	*Breadth*	26—4
	12		12
	87		56
	42		26
Inches	507		316
	216		
	3042		
	507		
	1521		
Inches 144 in 1 Foot *ſquare*	160212 (1112 Feet *ſquare*		
	144		
	162		
	144		
	181		
	144		
	372		
	288		
	84 Parts of a *ſquar.*Foot,or $\frac{5}{8}$ Parts		

1112 Feet
multiply by 8 *Shil. Price*
8896
for $\frac{5}{8}$ of a foot 5 *s.*
8901
$\frac{1}{2}$ 445.1 *s.*
l.

Anſ. He muſt have therefore, to wit, for the 1112 Feet therein, and $\frac{5}{8}$, 445 Pounds, 1 Shilling.

III. Example.

Queſt. Tell me the *ſquare* Feet in that Hinging, whoſe *Length* is 12 Feet, 4 Inches, and *Breadth*,

Breadth 8 Foot, 6 Inches? For each *ſquare* Foot the Merchant demands 12 Shillings.

Feet, *Inch.* *Feet*, *Inch.*
Length—12—4 *Breadth*—8— 6
12 12
28 22
12 8
148 102
102
296
148
144) 15096 (104 Foot
144 12 *s.* the *Price*
696 208
576 1049 *Anſ.* 64 Pounds, 17
120 125.7 Shillings therefore to the
02.17 *s.*
l. Merchant.

IV. Example.

Queſt. Tell me the *Roods* in that Dyke or Wall, whoſe *Length* is 324 Ells, 2 Quarters, and *Breadth* or *Height* 2 Ells, 1 Quarter? Conſider, That in a *Rood* there are 6 Ells; multiplied in it ſelf, is 36 Ells in the *Rood*. Each *Rood* of Work being, by Agreement, 6 Pounds. The Work will ſtand thus.

Ells, *qrs.* *Ells*, *qrs.*
L. 324 : 2 *B.* 2 : 1
4 4
L. 1298 *qrs.* *B.* 9 *qrs.*
B.——9

16) 11682 (730 Ells *ſquare*
112
48
48
2 reſts Ells *Roods*,
divided by 36) 730 (20 and ¼
72 6 *l.*
Ells 10 120 *l.*
the ¼ is ——— 1 : 10
Total *l.* 121 : 10

Anſ. Therein there are 20 *Roods* and ¼, whoſe *Price* will be 121 Pounds, 10 Shillings.

V. Example.

Queſt. A Sclater having ſclated 3 *Roofs*, *viz.* the firſt *Roof* containing in *Length* 16 Ells, and *Breadth* 12 Ells; the ſecond *Roof*, containing 12 Ells in *Length*, and 8 Ells in *Breadth*; the third *Roof* 18 Ells in *Length*, and 10 Ells in *Breadth*? Now I demand what *Roods* are therein, and how much the Workman muſt have therefore, at the Rate of 8 Pounds *per Rood*?

1ſt *Roof*, *Ells*
L. —16
B. —12
32
16
1ſt 192 El.
2d 96
3d 180
To. 468 Ells

2d *Roof*, *Ells*,
L. 12
B. 8
96 Ells

3d *Roof*,
L. 18
B. 10
180 El.

36) 468 (13 *Roods*
36 8 *l.*
108 104
108 *l.*

Anſ. Theſe *Roofs*, conſiſting of 13 *Roods*, will amount to 104 *l.*

Men

MENSURATION of SOLIDS.

THis Rule teacheth us to know the true *Meaſure* of any *ſolid* Piece of Wood or Stone, conſiſting of *Breadth*, *Length*, and *Thickneſs*.

Nota, This Rule conſiſts of Matter in *Breadth*, *Length* and *Thickneſs*, to be multiplied in one another, in order to know the Feet *ſolid* therein contained.

Direction.

In doing any Operation belonging to this Rule, you muſt multiply your *Length* by your *Breadth*, and the *Product* of *Length* and *Breadth*, you muſt multiply by your *Thickneſs*; and theſe 3 multiplied in one another, is your Feet *ſolid* therein contained, or of *Inches*; then you muſt divide their Total by the *Inches* in a *ſolid* Foot, and the Quote will be the Feet *ſolid* therein contained: As Example.

12 Inches is one Foot in *Length*.
12
144 Inches is one *ſquare* Foot, *ſuperficies*.
12
1728 Inches is one *ſolid* Foot.

I. Example.

Queſt. There is a Piece of Wood, whoſe *Length* is 6 Foot, and *Breadth* 4 Foot, and *Thickneſs* 5 Foot; I demand the *ſolid* Feet therein, and *Price* at the Rate of 6 Shillings for each Foot *ſolid*?

Foot,
L. 6
B. 4 *Anſ.* Theſe 120 Feet *ſolid*
24 will coſt you 36 Pounds.
Thick. 5
Solid 120 Feet therein.
Price——6 Shillings *per* Foot.
72.0
½ 36

Explication.

You ſee your *Length* 6 Foot, multiplied by 4 the *Breadth* thereof, produceth 24 for their *Product.* Theſe 24 being multiplied by 5 the *Thickneſs* thereof, their total *Product* then will amount to 120 *ſolid* Feet therein; which 120 Feet I multiply by the *Price* agreed upon for Foot, which is 6 Shillings, and its *Product* will be 720 Shillings. Which 720 Shillings I half, cutting off a Figure towards the right Hand, and I find their Price in Pounds to be 36, as clear from the Work it ſelf.

II. Example.

Queſt. There is a Stone of 12 Feet, 8 Inches *long*, and 8 Foot 3 Inches *broad*, and 6 Foot 2 Inches *thick*; I demand what *ſolid* Feet there will be be therein, and what the Maſon muſt have for his Work, at the Rate of 11 Shillings *per* Foot *ſolid*?

Foot,

Foot, In.	Foot, In.	Foot, In.
B. 8 — 3	L. 12—8	Thick 6— 2
12 —	12	12
99	32	74 Thic.

12
152 L.
B. 99
1368
1268
15048
74 Thickneſs
60192
105336
1728) 1113552 (644 ſolid Feet
10368 11s. per Foot
7675 644
6912 644
708.4
½ 354.4 s. and ⅓ is 3 s. 8 d.
720 Parts
of 1728 or more than ⅓ of a F.

Anſ. 644 Feet, ⅓ *ſolid*, will coſt you 354 Pounds, 7 Shillings, 8 Pennies.

Rule of FALSHOOD.

IT is ſo called, becauſe by falſe *Poſitions* or *Parts*, we come to find out a real *Poſition* or *Part*; or it may be defined from the *Scotiſh* Proverb, thus, *Where* Thieves *reckon*, *leal* Folk *come to their own again.*

Nota, This Rule conſiſts of *Perſons*, and their *Part* or *Share* they have in a certain Sum dividable amongſt them: And from the firſt falſe *Poſition* or *Share*, you come to form a right *Share* them to, accoading to their unequal *Parts* therein, which they claim a right to.

Direction.

To prepare the ſame for work, in order to find their true and real *Shares*, firſt divide the Subject dividable amongſt them, according to their *Part* they bear thereto, and having found all their *Parts* therein, proceed, and ſay, by the *Rule of Three direct*, If ſuch as one of their falſe *Shares* or *Parts* yield me ſuch a Sum as the Total of their *falſe Shares*, what will the Total of the Sum dividable amongſt them yield them for a real *Share*? Multiply your ſecond *Term*, or their *total* falſe *Poſitions*, by your third *Term* or Sum that is dividable, the Total of which two *Terms* divide by your firſt *Term*, or *Perſon's* falſe *Share*, and your Quotients will evince their real *Shares*.

I. Example.

Queſt. There are 100 Pounds to be divided amongſt theſe four *Perſons*, *A. B. C.* and *D.* whereof *A.* hath a third *Part* thereof, *B.* a fourth *Part*, *C.* a fifth *Part*, and *D.* a ſixth *Part* thereof. Now I demand their *Shares* therein according to their Ranking?

The Work will ſtand thus, as follows.

A. *l.*	*B.* *l.*	*C.* *l.*	*D.* *l.*
3)100(33 *l.*	4)100(25 *l.*	5)100(20 *l.*	6)100(16 *l.*
9	8	10	6
10	20	0	40
9	20		36
1			4
20			20
3)20(6 *s.*			6)80(13
18			6
2			20
12			18
3)24(8 *d.*			2
24			12
			6)24(4
			24

	l.	*s*	*d.*
A's Falſe *Share* is	33	06	08
B's Falſe *Share* is	25	—	—
C's Falſe *Share* is	20	—	—
D's Falſe *Share* is	16	13	04
Total falſe *Shares*	95	00	00

Then ſay,

l. *l.* *s.* *d.*	*B.*
A. If 95—33 : 6 : 8 *qt.* 100	If 95—25 *qt.* 100
20	100
666	95)2500(26 *l.*
12	190
1340	660
666	570

8000

```
      8000                                  30
       100  12)                             20
95)  800000(8421(70.1 s. d.               )600(6 s.
     760     84   35 : 1 : 9 20/95          570
     400     21                              30
     380     12                              12
      200     9 d.                        ) 360(3 d.
      190                                   285
      100                                    75
       95                                     4
        5                                 )300(3qrs
        4                                   285
       20 Parts                              15 Par.
     of 95                               of 95

        l.  s.   d.                        l.  s.  d. qrs.
 A's is 35  01 : 09 20/95   B's Part is 26 : 6 . 3 : 3 15/95

C. l.    l.      l.   D. l.  l.   s.  d.
If 95--20 qt. 100     If 95—16—13 : 4 qt. 100
      100                    20
95)2000(21 l.               333
    190                      12
    100                    4000
     95                      100  12)
      5                95)400000(4210(35.0
     20                    380     36    17:10
95) 100(1 s.               200     61
     95                    190     60
      5                    100     10 d.
     12                     95
                                           )240
```

)60 (0 *d.*
4
)240 (2 *qrs.*
190
50 Parts
of 95

50
4
)200 (2 *qrs.*
190
10 Parts
of 95

l. *s.* *d.* *qrs.*
C's is 21 : 1 : 0 : 2$\frac{50}{95}$

l. *s.* *d.* *qrs.*
D's Part is 17 : 10 : 10 : 2$\frac{10}{95}$

A's is—35 : 1 : 9 : 20
B's is—26 : 6 : 3 : 3-15
C's is—21 : 1 : 0 : 2-50
D's is—17 : 10 : 10 : 2-10
Pr.95) 100 : 00 : 00 : 0-95 (1

As you ſee this Example done, ſo perform theſe following, or any like them, by firſt knowing their falſe *Shares*, in order to know their real *Shares.*

II. Example.

Queſt. There is 575 Pounds to be divided amongſt theſe *Perſons*, *viz.* *A.* a third *Part* thereof, *B.* a fourth *Part*, C. a ſixth *Part*, and *D.* a eighth *Part* thereof: Now I demand their *Shares*?

III. Example.

Queſt. You are deſired to divide 3000 Pounds amongſt theſe three *Perſons*, *viz.* *D.* a fifth *Part* thereof, *B.* a ſixth *Part*, and *G.* an eighth *Part*: Now I demand their juſt *Share* thereof, according to their *Proportion* and *Part* therein?

Rule of PRACTICE.

IT is ſo called, becauſe it is a *plain* and *eaſy Method*, by which we find out *practical* and *plain Anſwers* to Things *demanded.*

Nota, This Rule conſiſts of various *Kinds* of Goods, and various *Prices*, both as to *Integers*, and their various *Fractions*, and then their *total Price.*

Direction.

To work or perform the ſame, it is neceſſary (for to know your *Fractions*, or broken *Parts*) that a Table be made you for the ſame, in order to facilitate your Work. After theſe are ſhown, you muſt multiply (your various *Goods* propoſed to be *ſold*) by their various *Prices*, of whatſoever *Deſignation* or *Denomination* they be. If the *Price* of one be Pounds or *Integers*, they muſt be multiplied ſo by theſe Pounds: And if the Price of one be a Fraction, or Fractions of theſe Pounds, as to their *Price*, they muſt be multiplied divided or halfed, accordingly, and their *Total* will be your Anſwer in Pounds, Shillings, or Pence.

Example.

As to the *Integer*, or whole *Number.*

Ells,
384, at 4 *l. per* Ell
4
L. 1536 : 00 : 00
Ells,
412, at 6 *l. per* Ell
6
L. 2472 in Anſwer
Ells,
48, at 3 *l. per* Ell
3
L. 144 in Anſwer

Ells,
278, at 8 *l. per* Ell
L. 8
2224 in Anſwer
Ells,
24, at 7 *l. per* Ell
L. 7
168 in Anſwer
Ells,
208, at 5 *l. per* Ell
5
L. 1040 in Anſwer.

TABLES of PRACTICE for the *Fractions*, or broken Parts of *Integers.*

The Even Parts of a *Pound.*

s.	*d.*		
10	0	is	$\frac{1}{2}$
6	8	is	$\frac{1}{3}$
5	0	is	$\frac{1}{4}$
4	0	is	$\frac{1}{5}$
3	4	is	$\frac{1}{6}$
2	6	is	$\frac{1}{8}$
1	0	is	$\frac{1}{20}$

The Even Parts of a *Shilling.*

d.		
6	is	$\frac{1}{2}$
4	is	$\frac{1}{3}$
3	is	$\frac{1}{4}$
2	is	$\frac{1}{6}$
1 $\frac{1}{2}$	is	$\frac{1}{8}$
1	is	$\frac{1}{12}$

Explication.

Agreeable to the firſt of theſe Tables, *viz.* the Even Parts of a Pound, it is neceſſary you ſhould conſider what *Fraction* they have Relation to of a Pound *Integer*, and then proceed to work, as evident from the following Examples, *viz.* conſider the *Fraction* of 1 Shilling in a Pound is $\frac{1}{20}$, and the *Fraction* of 2 Shillings is $\frac{1}{10}$ Part, or 2 Shillings neat, which you may multiply the Subject by, and the Product you may half, cutting off a Figure upon the right Hand, and your Anſwer will be in Pounds and Shillings. And the *Fraction* of 2 Shillings 6 Pennies is $\frac{1}{8}$ P*art* of a Pound *Integer*, and 3 Shillings, 4 Pennies is of Fraction $\frac{1}{6}$ P*art* of a Pound: And 4 Shillings is $\frac{1}{5}$ P*art* of a Pound: And 5 Shillings is $\frac{1}{4}$ P*art* of a Pound: And 6 Shillings, 8 Pennies is $\frac{1}{3}$ P*art* of a Pound: And 10 Shillings is $\frac{1}{2}$ P*art* of a Pound. This being conſidered aright, and fully underſtood, proceed to work the ſame as before directed, by multiplying and dividing them by the common Price.

Example.

l.
$\frac{1}{20}$ | 32 of Shalk, at 6 *s. per l.*
1
$\frac{1}{3}$ | 3.2
1 *l.* 12 *s. facit* in *Anſ.*

Ells of Laces,
$\frac{1}{12}$ of | 4320 at 2 *s.* 1 *d.p.* El
mul. | 2
$\frac{1}{2}$ | 8640
$\frac{1}{12}$ is | 360 the $\frac{1}{12}$ Div.

l.
$\frac{1}{10}$ | 432 of Barly, 2 *s. p. l.*
or 2
$\frac{1}{2}$ | 86.4
43 *l.* 4 *s.* in *Anſw.*

$\frac{1}{2}$ | 900.0 *s.*
is | 450 *l.* in *Anſwer.*

Ounces of Rice,
$\frac{1}{4}$ | 325 at 2 *s.* 3 *d.p.ou.*
2

mult.

m. ⅓ 650
81—3 the ¼ Div.
½ 73.1 3
is 36 *l.* 11 *s.* 3 *d.* in *Anſ.*

Quarters of Quil,
⅓ 412 at 2 *s.* 4 *d.*
2
m. ½ 824
137—4 the ⅓ Div.

½ 96.1— 4
is 48 *l.* 1 *s.* 4 *d. Anſ.*

Ells of Knittings,
218 at 2 *s.* 6 *d.*
½ 2
436
109 the ½ Div.
½ 54.5 *s.* Total
is 27 *l.* 5 *s.* in *Anſ.*

Nota, As theſe are done by Multiplication and Diviſion, ſo are all other ſmall Parcels, or ſmall Prices, *viz*, firſt multiply by your Shillings, and divide the Sum of Goods given by the *Fraction* of the Pennies in one Shilling. Afterwards add them together, as you ſee done; then half their Total, which will produce their total *Price* in Pounds, Shillings and Pennies.

Ells of Goods,
⅓ 312 at 4 *s.* 4 *d. per* Ell
4
1248
104 the ⅓ divided,
½ 135.2
is 67 *l.* 12 *s.* in *Anſ.*

Ells of Goods,
½ 324 at 6 *s.* 6 *d. per* Ell
6

1944
162 the ½ divided
½ 210.6 *s.*
is 105 *l.* 6 *s.* in *Anſwer*

Ells,
¼ 921 at 8 *s.* 3 *d. p.* Ell
7
6447
230— *d.* ¼ divided
667.7

$\frac{1}{2}$ | 667.7 : 3 *d.*
is | 333 *l.* 17. *s.* 3 *d. Anſ.*
Pounds of Goods
$\frac{1}{3}$ | 308 $\frac{1}{2}$ at 5 *s.* 4 *d.*
5

1540
102 : 8 *d.* $\frac{1}{3}$ divided
to | 2 : *d.* $\frac{1}{2}$ Ell
$\frac{1}{2}$ | 164.5 : 4 *d.*
is | 82 *l.* 5 *s.* 4 *d.*

In Anſwer, the 308 Ells and $\frac{1}{2}$, at 5 Shillings, 4 Pennies *per* Ell, is 82 Pounds, 5 Shillings, 4 Pennies.

Agreeable to the ſecond Table, *viz.* the even Parts of a Shilling 1 is $\frac{1}{12}$ Part thereof; and 1 and $\frac{1}{2}$ is $\frac{1}{8}$ Part; and 2 Pennies is $\frac{1}{6}$ Part; and 3 Pennies is $\frac{1}{4}$ Part; and 4 is $\frac{1}{3}$ Part; and 6 is $\frac{1}{2}$ Part of a Shilling. Theſe being fully underſtood, proceed to work the ſame, as before directed, by multiplying and dividing the ſame, as they occur by the common *Price* given.

Example.

Ells,
di. $\frac{1}{2}$ | 8468 at 6 *d. per* Ell
423.4 *s.*
is | 211 *l.* 14 *s.* 0 *d.* in *Anſwer.*

Pounds of Goods,
$\frac{1}{3}$ | 432 at 4 *d. per* Ell
14.4
is | 7 *l.* 4 *s.* 0 *d.* in *Anſ.*
Ounces.
$\frac{1}{4}$ | 432 at 3 *d. per Ou.*
$\frac{1}{2}$ | 10.8
is | 5 *l.* 8 *s. Anſ.*

Nota, When the *Price* of any Goods is the even Part of a Shilling, conſider firſt what Part of a Shilling it is; having found this out, divide the Sum (of Goods propoſed) by it, and the Quote will anſwer you in Shillings. Having ſhewed you this, as clear from the foregoing Example, I proceed to another Caſe, which is, when the *Price* is Farthings, or half Pennies, then bring the given Sum into Pence, and work as before directed: But if uneven Parts, as Penny Farthing, or Penny three Farthings, two Pennies Farthing, or ſuch like; then begin firſt with the even *Parts* of a Shilling: As Example, 342 Ells of any Thing at 3 Farthings *per* Ell, work firſt for the Penny therein, as before; then conſider if they come to ſo many Shillings thereby; then the 1 Farthing remaining, over the Pence taken from it, muſt be the fourth *Part* of them Goods; which having thus taken, and added the ſame to the Shillings coming by the Penny, the Work will be done, as to the total *Price* in Shillings: Which Shillings you muſt half, as before, to turn theſe to Pounds, Shillings, or Pence.

Example

Lib.
$\frac{1}{4}$ | 736 at $\frac{1}{4}$ *per* Ell
$\frac{1}{2}$ | 184
is | 15 *s.* 4 *d.* in *Anſ.*
Ounces,
$\frac{1}{2}$ | 434 at $\frac{1}{2}$ *d. per Ou.*
$\frac{1}{12}$ | 217

Ells,
is | 18 *s.* 1 *d.* in *Anſ.*
Ounccs, *d.*
$\frac{1}{2}$ | 7844 at $\frac{3}{4}$ *per Ou.*
$\frac{1}{12}$ | 3922
32.6 10 *d.*
is | 16 *l.* 6 *s.* 10.

Lib.
$\frac{1}{12}$ 7368 at 1 *d.*$\frac{1}{4}$ *p.l.*
$\frac{1}{4}$614
$\frac{1}{2}$ 15.3— 6 *d:*
is 7 *l:*13 *s:*6 *d:Anſ*

Ounces,
$\frac{1}{8}$ 7225 at 1 $\frac{3}{4}$ *d:p: Ou:*
$\frac{1}{6}$ 903—1 $\frac{1}{2}$
150—6 $\frac{1}{4}$
$\frac{1}{2}$ 105:3—7$\frac{1}{4}$
is 52 *l:* 13 *s:* 7 *d:* $\frac{3}{4}$
for *Anſ:*

Ells,
$\frac{1}{2}$ 3464 at 13 *d:p:*Ell
mul: 1
3464
288—8
$\frac{1}{2}$ 375:2—8
is 187 *l:* 12 *s:*8 *d:Anſ:*

Ounces,
4563 at 14 *d:p: Ou:*
1 *s.*
$\frac{1}{6}$ 4563
760— 6 *d:*
$\frac{1}{2}$ 532.3—6 *d·*
is 266 *l:* 3 *s:* 6 *d: Anſ:*

Ells,
432 at 16 *d:p:* Ell
1 *s.*
$\frac{1}{3}$ 432
144
$\frac{1}{2}$ 57.6
is 28 *l.* 16 *s.* in *Anſ.*

Ounces,
384 at 18 *d. per Ou.*
1 *s.*
$\frac{1}{2}$ 384
192
$\frac{1}{2}$ 57.6
is 28 *l.* 16 *s.* in *Anſ.*

As with theſe, ſo with all others. And ſo I cloſe *vulgar Arithmetick.*

FINIS.

DECIMAL ARITHMETICK.

IT may be ſo called, becauſe it conſiſts of various *Tenths*, *Hundreds* and *Thouſands*, Parts of an *Integer*, or Unite of a whole *Number* : So as thereby we may know what Relation ſuch and ſuch a *Part* may have to an *Integer* or Unite of whole *Numbers*.

Nota, This Piece of *Arithmetick* is contrived after an eaſy and plain Method, to find out what *Proportion* or *Value* a *Fraction* may have to an *Integer*, or intire *Number*, ſo that an perturbate *Demand* may have Acceſs to a calm and ſedate Anſwer.

Conſider, that *Decimal Fractions* have (to diſtinguiſh them from *Vulgar Fractions*) a Point or Comma as their *Sign* (to diſtinguiſh them from an *Integer*) put before their firſt Place, or Place of *Primes*, ſo called, and go ſtraight on in Line; whereas a vulgar *Fraction* is put one below another, with a Draught between them. Alſo it differs from the *vulgar Fraction*, in that its *Denominator* is never expreſſed, as

Example, .3 or .35 in *Vulgar* Way, it would ſtand thus, $\frac{3}{10}$, or $\frac{35}{100}$ *Parts*, and ſo of any other according to their Place and Degree; alſo in *Numbers* it differs as to its Value from the *Vulgar*; for the *Vulgar* in its *Numbers* increaſes its Value from the right Hand to the Left, and ſo runs in a contrary Channel from that of the *Decimal Numbers*, for it decreaſes its *Value* from the left Hand to the right: As Example, 347 in *vulgar* Value is 3 Hundred forty and ſeven Unites; whereas in the *Decimal*, thus, .347 is read 3 Tenths, 4 Hundred and 7 Thouſand Parts. So that it is evident from *vulgar* numbring, that from the right Hand 7 Unites we advance to the ſecond Place Forty, or 4 Tens, and from that to .3 Hundred. Now 3 Hundred 40 and 7 Unites, or Ones, are greater in Number from the right to the left Hand, than to ſay, .347 Thouſand Parts of any Thing. But ſee it more plain from the Table of *Notation* it ſelf.

	Notation of Vulgar		*Notation of Decim.*
4	Hundreds of Thou.	6	Primes, or Tenths
3	Ten of Thouſands	4	2ds, or Hundreds
4	Thouſands	8	3ds, or Thouſands
5	Hundreds	7	4th, or Ten Thouſ.
2	Tens	4	5th, or Hun. Thouſ,
3	Unites	3	6th, or Millions.

Explication.

From the Table of Notation in *Decimals*, as before was ſaid, you ſee the plain Decreaſe of its Value from the left Hand to the Right: As Example, 6 Tenth Parts are greater than 4 Hundred Parts of any Thing; and 4 Hundred Parts are greater than 8 Thouſand Parts of a Thing; and 8 Thouſand Parts are greater than 7 Ten Thouſand Parts of a Thing; and 7 Ten Thouſand Parts are greater than 4 Hundred Thouſand Parts of a Thing; and 4 Hundred Thouſand Parts are greater that 3 Million Parts of a Thing. Having this far explained the ſame, I come next to ſhew how you are to reduce a *vulgar Fraction* to a *Decimal*, and how to reduce the ſame to the *Value* it hath in one *Integer*. But before I do the ſame, I ſhall firſt define *Reduction*, and ſhew the Neceſſity of beginning with this Rule; and then ſhew the *Parts* of a *vulgar Fraction*, and explain them *Terms* or *Parts*, and ſhew what we are to do with them, in order to convert them to a *decimal Fraction*. Therefore I begin with the firſt Thing propoſed, *viz. Reduction* of *vulgar Fractions* to *Decimals*.

It is ſo called, becauſe we muſt reduce, or bring any *vulgar Fraction* ſo given, into *decimal Fractions*, for a ready Way in order to know the Relation it bears in *Value* to an *Integer*.

Explication.

This Rule of *Reduction* is neceſſary to begin with, becauſe we cannot know eaſily the *Value* of any *Fraction* (but as its being ſuch a *Part* of ſuch a *Thing*) without firſt converting the ſame to *decimal Fractions*, and then to *Value*; or how much of the neareſt *Denomination* it may be to an *Integer*. Now the *Parts* of a *vulgar Fraction* go under theſe *Names*, *Terms* and *Deſignations*, viz. *Numerator* or *Nominator*, and *Denominator*. The firſt *Term* goes under the *Name* or *Title* of *Numerator* or *Nominator*, becauſe it is that which *nominates*, *names*, *numbers* or *deſigns* the *Fraction*, and is ordinarily put uppermoſt above the Draught ſo placed 2, and the other *Term* is called, or goes under the *Name* and *Title* of *Denominator*, becauſe it *denotes*, or *denominates* what *Part* that *Numerator* or *Nominator Fraction* is, and ſtand thus,

2 *Nominator* } which is to ſay, 2 *third Parts*
3 *Denominator* } of ſuch and ſuch an *Integer*.

Having explained the *Terms*, I next proceed to ſhew what you are to do with theſe two *Terms* of *Nominator* and *Denominator* of a vulgar *Fraction*, in order to convert them to a *decimal Fraction*. Now this brings me to ſhew how you are to reduce a *vulgar Fraction* to a *decimal Fraction*. In doing the ſame, you muſt annex 3 or 4 Cyphers to your *Numerator*, and when ſo done, divide the ſame by your *Denominator*, (puting the *decimal Fraction's* Character before ſpoke of, to wit, the *Comma* or *Point* before your firſt *decimal Fraction*'s Figure in the *Quote*) and as oft as you get the ſame in it, place it in your *Quote*; and if any Thing remain after you have taken it 4 Times, take it once more, (to wit, the *Denominator*) than it can be found in it; and ſubſtract the uppermoſt *leſſer Sum*, from the undermoſt or *greater Sum*, marking the *Exceſs*, which *Exceſs* will be evidently *ſpewed* out in your reducing of the *decimal Fractions* to *Value*. Then this being done and finiſhed, I proceed to convert the *decimal Fractions* to *Value*, thus, by multiplying them *decimal Fractions* by the firſt *Denotation* of *Fractions* in the *Integer* to which that *vulgar Fraction* hath Relation. When ſo multiplied and made Total of, cut off as many Figures upon the right Hand of that Total, as you have of *decimal Fractions* in your *Multiplicand*, and that Figure, or Figures upon the left Hand will be your firſt *Denotation* of a broken *Number* in your *Integer*; and ſo on, multiplying Remainders, till you have done with the various *Denotations* of that *Kind* of *Integers* ſo given: And as with one *Kind*, ſo with all others, according to their various *Kinds*. Having thus far made your Way clear, I proceed next to an Example which lies in *reducing* $\frac{2}{3}$ of a Pound, a *vulgar Fraction* to a *decimal Fraction*, and thence to *Value*.

Thus the Work will, as directed.

Numerator 20000 (
Denominator 3
Numerator divide
by *Denomin.* 3.)20000 (.6667 convert to *Valu*
18 by 20 the Mul.
20 *s.* 13.3340
18 12
20 *d.* 4.0080
18 *Exceſs*
20
21
1 *Exceſs*

Anſ. $\frac{2}{3}$ that vulgar *Fraction* of a Pound will amount to in *decimal Fractions* .6667 *Primes*, *2ds*, *3ds* and *4ths*, or *Value* thereof in 13 Shillings 4 Pennies, as you ſee from the Work.

Queſt. Reduce $\frac{4}{5}$ Parts of a Pound to *Value*? Thus.

Nominator.
Denomin. 5) 40000 (.8
40 20
00 *s.* 16.0

Anſ. $\frac{4}{5}$ Parts thereof will amount to .8 *Primes*, or in Value 16 Shillings.

Queſt. Reduce 13 Shillings a *vulgar Fraction*, to *decimal Parts* of a Pound the *Integer*; it is clear, that 13 Shillings is 13 Parts of 20 a Pound, thus, $\frac{13}{20}$, and then to *Value*?

Numerator.

Denomin. 20) 13000 (.65
120 20
.100 13.00
100 *s.*
000

which 13 Shillings of *vulgar Fractions*, is 6 *Primes*, 5 *2ds* or *Hundreds* in *Decimals*, equal to 13 Shil. See the Work.

Nota, You may reduce (after another *Method*) *decimal Fractions* to *Value's*, *known* Part or P*arts* in one *Integer*, thus, by doubling your Figure in the Place of P*rimes*; and to the total P*roduct* thereof add one, as oft as you find 5 in the Place of 2ds, or Hundreds: And if 5 cannot be found in the ſame, take one from the Number of P*laces* behind P*rimes* or *Tens*; and when ſo done, *divide* their Total by 4, and the like, according to their *Kinds*: And that in the *Quote* will be Pennies, or other *Kinds*, and the *Remainder* Farthings, or otherwiſe, according to their *Kinds*: As in the Example above.

.65
2
12
5 is found 1 Time in 5 (
add is .13 *s.* in all

So by this you ſee the Work clear.

Another Example.

From the *Decimals* in $\frac{2}{3}$ P*arts* of a Pound, are,
.6667
2

12
5 in 6. 1 Time, and 1 remaining
13 *s.* from the Remainder 167 ſubſtract
1, remains then 166; divide by
4, as before directed, 4) 166 (4 *d.*
16
6 of *Exc:*

equal to 80 ten Thouſand Parts, or which is too much.

Queſt. Reduce $\frac{2}{3}$ *Parts* of an Ell *Integer*, to a *decimal Fraction*, and theſe to *Value?* Thus.

Nomin.
Denom. 3) 2000 (.6667
18 4
20 *qrs.* 2.6668
18 4
20*nail.* 2.6672 *Exc.*
18
20
21
1

Anſ. The $\frac{2}{3}$ *vulgar Fraction* of an Ell *Integer* is in *Decimals* .6667, equal in *Value* to 2 Quarters, 2 Nails. Thus far have I exemplified the Reduction of a *vulgar Fraction* to *Decimals* and *Value:* Now I proceed to give you a Form of ſome *Tables*, whereby you may know (at firſt View) the *decimal Fractions* in *vulgar Fractions*, and ſo I begin with the broken *Parts* of one Pound, or *Integer*.

A TABLE of *Decimals*, one Pound being *Integer*.

s.		*Deci.*
19		.95
18		.9
17		.85
16		.8
15		.75
14		.7
13		.65
12	is	.6
11		.55
10		.5
9		.45
8		.4
7		.35
6		.3
5		.25
4		.2
3		.15
2		.1
1		.05

Pennies		*Decimals*
11		.04584 *Exc.* 16
10		.04167 *Exc.* 8
9		.0375
8		.03334 *Exc.* 16
7		.02917 *Ex.* 8
6	is	.0250
5		.02084 *Exc.* 16
4		.0167 *Exc.* 8
3		.0125
2		.0084 *Exc.* 16
1		.0042 *Exc.* 8

Farthing Decimals,

3		003125
2	is	.0020834 *Exc.* 64
1		.0010417 *Exc.* 32

A TABLE of *Decimals* in *Meaſure*, an *Ell* being the *Integer*.

Quarters, In one Ell *Integer*			*Decim.*
	3	—	.75
	2	is	.50
	1	—	.25

Nails		*Decim.*
3		.01875
2	is	.01250
1		.00625

A TABLE of *Decimals* in Land *Meaſure*, a *Glebe* being the *Integer*.

Acres,		*Decimals*
3	—	.75
2	is	.50
1	—	.25

Roods,		*Decimals,*
39	—	.24375
38	—	.23750
37	—	.23125
36	—	.22500
35	—	.21875
34	—	.21250
33	*is*	.20625
32	—	.20000
31	—	.19375
30	—	.18750
29	—	.18125
28	—	.17500
27	—	16875
26	—	.16250
25	—	15625
24	—	.15000
23	—	.14375
22	—	.13750
21	—	.13125

		Dceimals,
20	—	.12500
19	—	.11875
18	—	.11250
17	—	.10625
16	—	.10000
15	—	.09375
14	—	.08750
13	—	.08125
12	is	.07500
11	—	.06875
10	—	.06250
9	—	.05625
8	—	.05000
7	—	.04375
6	—	.03750
5	—	.03125
4	—	.02500
3	—	.01875
2	—	.01250
1	—	.00625
.	—	

Ells,	—	*Decimals,*	
5	—	.0052084	*Exc.* 64
4	is	.004167	*Exc.* 32
3	—	.003125	
2	—	.002084	*Exc* 64
1	—	.0010417	*Exc.* 32

A

A TABLE of Dry *Meaſure* in *Decimals*, one *Chalder* being the *Integer* thereof.

Bolls,	*Decim.*	*Firl.*	*Decimals,*
15	·9375	3	.046875
14	·8750	2 is	.031250
13	·8125	1	.015625
12	·7500		
11	·6875	*Pecks,*	*Decimals,*
10	·6250	3	.00117 1875
9	·5625	2 is	.000781250
8	·5000	1	.000390625
7 is	·4375		
6	·3750		
5	·3125	*Forp.*	*Decimals,*
4	·2500	3	.00029296875
3	·1875	2 is	.00019531250
2	·1250	1	.00009765625
1	.0625		

A TABLE of *Decimals* in *Liquors*, one *Hogſhead* being the *Integer* thereof.

Gal.		*Decim*	*Gal.*	*Decim.*	*Pints,*		*Decimals,*
15		·93750	7	.43750	7		.0546875
14		·87500	6	.37500	6		.0468750
13		,81250	5	.31250	5		.0390625
12	is	·75000	4	.25000	4	is	.0312500
11		.68750	3	.18750	3		.0234375
10		.62500	2	.12500	2		.0156250
9		.56250	1	.06250	1		.0078125
8		.50000					

Chop.	Decimals,	Gills,	Decimals,
1 is	.00390625	3	.0001464844 *Exc.* 512
Much.	*Decimals,*	is 2	.0000976563 *Ex.* 1024
1 is	.001953125	1	.0000488282 *Ex.* 1536

A TABLE of *Decimals* in *Weight Trois*, a *Stone* being the *Integer* thereof.

Pounds		*Decimals,*	*Cun.*		**Decimals,**
15		.93750	7		.02734375
14		.87500	6		.02343750
13		.81250	5		.01953125
12		.75000	4		.01562500
11		.68750	3		.01171875
10		.62500	2		.00781250
9		.56250	1		.00390625
8	is	.50000			
7		.43750	*Drops*		*Decimals,*
6		.37500	15		.003662109375
5		.31250	14		.003417968750
4		.25000	13		.003173828125
3		.18750	12		.002929687500
2		.12500	11		.002685546875
1		.06250	10		.002441406250
Ounces		*Decimals,*	9	is	.002197265625
15		.05859375	8		.001953125000
14		.05468750	7		.001708984375
13		.05078125	6		.001464843750
12		.04687500	5		.001220703125
11		.04296875	4		.000976562500
10		.03906250	3		.000732421875
9	is	.03515625	2		.000488281250
8		.03125000	1		.000244140625

Grains I omit, not being very neceſſary, or may be known as they occur, as before directed.

A TABLE of *Decimals* in *Apothecaries Weight*, one *Pound* being the *Integer* thereof.

Ounces		Deci.	*Ounces*		*Decimals*,
15		·9375	2		,1250
14		·8750	1		.0625
13		·8125	*Drams*		Decimals,
12		·7500	7		.0546875
11		·6875	6		.0468750
10		·6250	5	is	.0390625
9		·5625	4		.0312500
8	is	·5000	3		.0234375
7		·4375	2		.0156250
6		·3750	1		.0078125
5		.3125	*Scrupl.*		*Decimals*,
4		.2500	2		.00520834*Ex.*256
3		.1875	1		.00260417*Ex.*128

Grains		*Decimals*,
19		.0024739584 *Exc.* 512
18		.0023437500
17		.0022135417 *Exc.* 256
16		,0020833334 *Exc.* 512
15		.0019 31250
14		.0018229167 *Exc.* 256
13	is	.0016927084 *Exc.* 512
12		,0015625000
11		.0014322917 *Exc.* 256
10		,0013020834 *Exc.* 512
9		.0011718750
8		.0010416667 *Exc.* 256
7		,0009114584 *Exc.* 512
6		.0007812500

Grains,

Grains,		*Decimals,*
5		.0006510417 *Exc.* 256
4	is	.000520834 *Exc.* 512
3		.000390625
2		.0002604167 *Exc.* 256
1		.0001302084 *Exc.* 512

A TABLE of *Decimals* in *Baxters Weight*, one *Pound* being the *Integer* thereof.

Ounces		*Decimals,*	*Ou.*	*Decimals,*
11		.91667 *Exc.* 4	5	.41667 *Exc.* 4
10		.83334 *Exc.* 8	4	.33334 *Exc.* 8
9		.75000	3	.25000
8		.66667 *Exc.* 4	2	.16667 *Exc.* 4
7	is	.58334 *Exc.* 8	1	.08334 *Exc.* 8
6		.50000		

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p.w.		*Decimals,*	*p.w.*		*Decimals,*
19		.0791667 *Exc.* 8	9		.0375000
18		.0750000	8		.0333334 *Ex.* 16
17		.0708334 *Exc.* 16	7		.0291667 *Ex.* 8
16		.0666667 *Exc.* 8	6	is	.0250000
15		.0625000	5		.0208334 *Ex.* 16
14	is	.0583334 *Exc.* 16	4		.0166667 *Ex.* 8
13		.0541667 *Exc.* 8	3		.0125000
12		.0500000	2		.0083334 *Ex.* 16
11		.0458334 *Exc.* 16	1		.0041667 *Ex.* 8
10		.0416667 *Exc.* 8			

Grains,

Grains		*Decimals*,	
23		.00399306	*Exc.* 256
22		.00381945	*Exc.* 320
21		.00364584	*Exc.* 384
20		.00347230	*Exc.* 448
19		.00329862	*Exc.* 512
18		.00312500	
17		.00295139	*Exc.* 64
16	is	.00277778	*Exc.* 128
15		.00260417	*Exc.* 192
14		.00243056	*Exc.* 256
13		.00225695	*Exc.* 320
12		.00208334	*Exc.* 384
11		.00190973	*Exc.* 448
10		.00173612	*Exc.* 512
9		.00156250	
8		.00138889	Exc. 64
7		.00121528	Exc. 128
6		.00104167	Exc. 192
5		.00086806	Exc. 256
4		.00069445	Exc. 320
3		.00052084	Exc. 384
2		.00034723	Exc. 448
1		.00017362	Exc. 512

Nota, Theſe TABLES will be of ſingular *Uſe* for young Beginners, to know the *decimal Fractions* in ſuch and ſuch a *vulgar* FRACTION, according to their various *Kinds* or *Qualities*; all of them being exactly calculated and fitted for the Purpoſe, without any Miſtake.

Having thus far paved the Way by theſe preceeding *Tables*, I next proceed in order, to perform *Addition's* Part of *Vulgar's* decimally. See the Work following.

ADDITION OF DECIMALS.

IT is to be done the ſame Way as the *vulgar* was, by adding one Figure to another; but only you muſt conſider their *Quantity*, or how much of one Thing is contained in *Quality* or *Kind*, and that is Ten in all *decimal* Performances, whether of *Addition*, *Subſtraction*, *Multiplication* or *Diviſion*, &c. even ſo as with *Integers* in *Vulgar*.

Nota, To perform the Examples hereof, you muſt (after you have added all the *decimal Fractions* together, and made of them a *Total*) put a *Point* or *Comma* before the Place or *Primes*, to diſtinguiſh them Decimals, from the *Integers* next to be wrought, carrying what Tens you have in the Place of *Primes*, to the firſt Place of *Integers*; and ſo proceed with the *Integers*, as you did with the Decimals till done: Afterwards, having made a *Total* of all of them, convert your *decimal Fractions* to *Value*, by multiplying them by the firſt *broken Number* of their *Kind*, cuting off in their *Total* as many Figures towards the right Hand, as you have of Figures in your *Multiplicand*, and then theſe upon the left Hand of the cuting off will be your *Value* required of a *vulgar Fraction* contained in theſe *decimal Fractions.* And as you perform the firſt Example, ſo with all others according to their *Kind.*

I. Example.

	Integers or Pounds, Decimals
Lent to D. R. ————————	7897.7270834
To Payment *of two Bills* —	4797.519825
To Holland for his Uſe ——	1273.5843817
To Materials, as per *Account*	2732.0020834
Total expended ——	16700.8333735
Ballance yet reſting —	88 3.1062901
Pr*oof* ——	16700.8333735

Explication.

You ſee by the Work of the foregoing Example (beginning at the right Hand Figures of *Decimals*, as in *Vulgar*. I ſay, 4 and 7 is 11, and 11 and 4 is 15, which is 5 over ten to ſet down; and carry that one *Ten* therein to the next Place in *decimal Fractions*, and ſay, 1 I carry, and 3 is 4, and 4 and 1 is 5, and 5 and 5 is 10, and 10 and 3 is 13; which I find to be 3 over ten to ſet down, and carry the one Ten to the next *Place* to be added, ſaying, 1 I carry, and 8 is 9, and 9 and 8 is 17, and 17 and 2 is 19, and 19 and 8 is 27; which I find to be 7 to be ſet down, and carry 2 *Tens* to the next *Place*, ſaying, 2 and 3 is 5, and 5 and 8 is 13, which is 3 to ſet down; and carry one *Ten* to the next *Place*, ſaying, 1 I carry, and 2 is 3, and 3 and 4 is 7, and 7 and 9 is 16, and 16 and 7 is 23; which will be 3 to ſet down below, and carry 2 *Tens* to the next *Place*, ſaying, 2 I carry, and 8 is 10, and 10 and 1 is 11, and 11, and 2 is 13; which I find 3 to be ſet down, and 1 *Ten* to carry to the next Place, which falls to be the *Place* of *Primes* in the *decimal Fractions*, ſaying, 1 I carry, and 5 is 6, and 6 and 5 is 11, and 7 is 18; which is 8 to ſet down, and one *Integer* to carry therefrom to the Place of *Unites* in *Integers*, ſaying, 1 I carry therefrom to 2, is 3, and 3 and 3 is 6, and 6 and 7 is 13, and 13 and 7 is 20; which is 0 to place down, and carry 2 *Tens*, ſaying, 2 I carry and 3 is 5, and 5 and 7 is 12, and 12 and 9 is 21, and 21 and 9 is 30, which is 0 to ſet down, and carry 3 to the next *Place*, ſaying, 3 I carry, and 7 is 10, and 10 and 2 is 12, and 12 and 7 is 19, and 19 and 8 is 27; which is 7 to ſet down, and carry 2 *Tens* to the next *Place*, ſaying, 2 I carry, and 2 is 4, and 4 and 1 is 5, and 5 and 4 is 9, and 9 and 7 is 16; which is 6 to ſet down, and 1 to carry; which one I carry, not having no other *Place* in the *Operation* or Example to work, in order to carry it to, ſo I place it down in its own proper *Place* before the 6, and then I find the whole to amount to 16700 Pounds or *Integers*, and .8333735 *decimal Fractions*. To convert theſe *decimal Fractions* to *Value*, ſee the Method before directed.

Take your *Decimals* therein, and *multiply* them by the firſt *broken Number* of a Pound, which is 20; and from the *Total* thereof cut off as many *Figures* towards your right Hand, as you have of *decimals Figures* in your *Multiplicand*, and theſe cut off upon the left Hand will be your *Value* in Shillings. Then theſe upon your right Hand *multiply* by 12, and from their *Total* cut off, as before, and theſe upon the left Hand will be your Pennies. Then again theſe upon the right Hand that were cut off, multiply by 4, and from their Total cut off, as before directed, and then theſe upon the Left will be Farthings in *Value*: So that theſe upon the right Hand (if any remain) will be but *Exceſs* of *infinite Numbers* ſpewed out. See the Work.

Total is 16700.8333735
20
s. 16.6674700
12
d. 8.0096400
4
.0385600
Exceſs of *infinite Numbers*:

Anſ. The *total Sum* in *Value* is 16700 Pounds, 16 Shillings, 8 Pennies, equal in *Value* to 16700 *Integers*, and .8333735 *decimal Fractions*:

Nota, If you want to know the *Value* of *Ballance*, it is to be done this ſame Way as above. Now as you ſee this Example performed, ſo all others, according to their *Kinds*, as will afterwards be ſhown you.

This Example is agreeable to the *Vulgar*.

Integers, or Ells, *Decimals*,
Sold ——— 372.8750
More ——— 478.6875
More ——— 784.6250
Total ſold— 1996.1875
Ballance — 1263.3125
Proof — 1996.1875
Value 4
0 *qrs.* 7500
4
Nails 3.0000

Integers, or *Stones*, *Decimals*,
Sold —— 732.79965549045 1389
Item, —— 278.657823350695 . . .
Item, —— 223.525444878473 . . .
Total — 1334.98292371961 9389
Ballance— .602.183268229168 . . .
Proof— 1334.982923719619389

Integers, or *Hogſheads*, *Decimals.*
Impr. —— 323.6543945313
Item, —— 478.7228027344
Item, —— 732.6739257813
Total —— 1535.0511230470
Ballance 1211.3967285157
Proof — 1535.0511230470

Integers, or *Glebes*, *Decimals*,
Impr. —— 748.860417
Item, —— 389.614584
Item, —— 978.603125
Total : 2117.078126
Value : : : 4
Acres —— .312,04
40
Roods : : 12.500160
: : : : : : 6
Ells : : : 3.000960
Exceſs

Integers, or *Chalders*, *Decimals*,
Impr. —— 385.9232421875.
Item, —— 473.78193359375
Item, —— 298.6732421875.
Total — 1158.37841796875
: : : : 16
Value —— 227050781250
—— 37841796875
Bolls —— 6.05468750000
: : : 4
Firlots —— 2.1875000000
: : : 4
Pecks —— 0.7500000000
: : : 4
Forp. —— 3.0000000000

APOTHECARY.

Integers, or *Pounds*, *Dceimals*,

Impr. ——	325.7257812567
Iteu, ——	497.52760417 ..
Item, ——	976.30442709 ..
Total —	1799.5578125167

BAXTER.

Integers, or *Pounds*, *Decimals*,

Impr. ——	732.88577056
Item, ——	478.95278118
Item, ——	347.69375334
Totol	1559.53230508

Integers, or *Pounds*, *Decimals*,

Lent in Money	22.73334
Item, more lent	48.625 ..
Item, more lent	18.94167
Total lent	90.30001
Ballance -	41.67501
Proof -	90.30001
	20
s.	6.00020

SUBSTRACTION OF DECIMALS.

THis Rule is to be performed by taking one Figure out of another, as you did the *Vulgar*, in whole *Numbers*; only obſerve, that where you have *Integers* and *decimal Fractions* concerned, put a *Point* or *Comma* (as before directed) betwixt your *Integers* and *decimal Fractions*; and ſo proceed to work them, by borrowing and paying home *Tens* as oft as you have need for them, as well with the *decimal Fractions*, as with the *Integers*.

I. Example.

	Integers or Pounds *Dici.*
Lent in all to *D. R.* ——	16700.8333400
Paid in all by him ——	.7897.7270834
Ballance reſting by him—	.8803.1062566
Proof ———	16700.8333400

Explication.

Thus you ſee from the Example above, I ſay, (beginning at the right Hand Figures) take 4 from 0 I cannot, but 4 from 10 I borrow, and I find 6 to be the *Difference*; which 6 I place under the 4, and ſo proceed, ſaying, 1 I borrowed to 3, make 4: Then 4 from 0 I cannot, but 4 from 10 I borrow, then I find 6 again to be the *Difference*; which 6 I place under 3, and ſo proceed, ſaying, 1 I borrowed to 8, make 9, then take 9 from 4 I cannot, but 9 from 10 I borrow, and I find 1 to be the *Difference*; which 1 of *Difference* I add to the 4 I could not get it out of, and then it will make 5, to be placed below the 8; and ſo proceed, ſaying, I 1 borrowed, and 0 the next Figure to be wrought is ſtill one; ſo take 1 from 3, there will remain 2, which 2 I place under the 0, and go on, ſaying, Take 7 from 3 I cannot, but 7 from 10 I borrow, and I find 3 to remain; which 3 being added to the other 3 I could not get it out of, and I find it to be 6, to place down below the 7; and ſo I proceed with the one I borrowed, and 2 is 3, ſaying, Take 3 from 3, I find 0 the *Difference*, to be placed below the 2, and ſo proceed to 7 in the Place of *Primes* of the *decimal Fractions*, ſaying, Take 7 from 8, I find one to remain of *Difference*; which 1 I place below the 7, and ſo proceed to the Place of Unites in *Integers*, (puting a *Point* before that *One* in the Place of *Primes*, as before directed, to diſtinguiſh theſe from the *Integers* that are to follow) ſaying, *Take* 7 from 0 I cannot, but 7 from 10 I *borrow*, and find 3 to be the *Difference*; which 3 I place below the 7, and ſo proceed, ſaying 1 I *borrowed*, and 9 is 10; take 10 from 0 I cannot, but 10 from 10 I *borrow*, and find 0 the *Difference* to remain, and ſo place that 0 below the 9, and go on, ſaying, 1 I *borrow*, and 8 make 9; then take 9 from 7 I cannot, but 9 from 10 I *borrow*, and find 1 of *Difference*; which 1 I add to the 7 I could not get it out of, which will make 8, to be ſet down below that 8, and ſo proceed, ſaying, 1 I *borrow*, and 7 make 8; then take 8 from 6 I cannot, but 8 from 10 I *borrow*, and there *remains* 2; which 2 I add to 6, the *Figure* I could not get it out of, which will make 8, to be placed below that 7, and ſo proceed with the one I *borrowed* to *Cypher*, which make ſtill one, ſaying, *Take* 1 from 1, I find the *Difference* to be *Cypher*.

Now as it is with this Example, ſo with all others (according to their *Kinds*) belonging to this Rule, as evident from the following Examples.

Nota, To convert any *Ballance* of *decimal Fractions* to *Value* belonging to *Subſtraction*, you muſt follow the ſame Method, as was uſed in the preceeding *Rule* of *Addition*; only conſider them according to their different *Kinds*: And ſo cut off as many Figures to the right Hand of your *Total*, as you have *decimal Figures* in your *Multiplicand*, and that upon the left Hand will be your *Value* of that *Total*; and *proceed* with the reſt of the various *Denotations* of *vulgar Fractions*, till done, as from the *Ballance* of this firſt *Example* made plain.

Ballance

Ballance is .1062566 *Decimals*,
20
s. 2.1251320
12
d. 1.5015840
4
qrs. 2.0063360
Exceſs

Anſ. The *total Ballance* (when Payment is *ſubſtracted* from *total Debt lent*) is 8803 Pounds or *Integers*, and .1062566 *Decimals*, equal in *Value* to 8803 *Pounds*, 2 *Shillings*, 1 *Penny*, 2 *Quarters*.

Now, as with the Performance of this *Ballance*, ſo with all others belonging to this Rule, according to their various *Kinds*.

II. Example.

	Integers, or Ells, *Decimals*,
Sold in all to D. F.	1996.1875
Paid in all by him	.732.875.
Ballance reſting	1263.3125
Proof	1996.1875

III. Example.

	Integers, or *Stones*, *Decimals*,
Bought in all from J. D.	1334.982923719618056
Paid in all by him :	.732.799655490451389
Ballance due by him	.602.183268229166667
Proof : :	1334.982923719618056

IV. Ex-

IV. Example.

Integers, or *Hogſheads*, *Decimals*,

Sold in all	1535.0528808594
Paid in all	.323.6543945313
Ballance due	1211.3984863281
Proof	1535.05288808594

V. Example.

Integers, or *Chalders*, *Decimals*,

Bonght in all	1158.40654296875
Paid in all :	.385.92324218750
Ballance reſting	.772.48330078125
Paoof	1158.40654296875

VI. Example.

Integers, or *Glebes*, *Decimals*,

Sold in all	2117.078125
Paid iu all	.748.860417
Ballance :	1368.217708
Proof :	2117.078125

VII. Example.

APOTHECARIES.

Integers, or *Pounds*, *Decimals*,

Bought in all from D. R.	1799.5578125040
Paid in all by him : :	.325.7257812567
Yet found reſting by him :	1473.8320312473
Proof :	1799.5578125040

VIII. Example, Baxter's *Weight*,

	Integer, or *Pounds*, *Decimals*,
Bought in all from T. D.	1559.53229170
Paid in all by him : :	.732.88577056
Ballance due : : :	.826.64652114
Proof :	1559.53229170

IX. Example in *Money*,

	Integer, or *Pounds*, *Decimals*,
A. *Lent to* B. *firſt* : : :	342.9 . . . :
Item, *again to* ditto : : :	:22.63334
Item, *again to* ditto : : :	.18.425 . .
Total lent by A. *to* B. : :	383.95834

	Integer, or *Pounds*, *Decimals*,
B. *paid to* A. *firſt* : : :	218.93334
Again paid to ditto : : :	.92.64167
Again paid to ditto : : :	.28.4167 :
Paid in all by B. *to* A. : :	339.99171
Ballance due by B: *to* A. *in* :	.43.96663
Proof thereof : :	383.95834

MULTIPLICATION OF DECIMALS.

THis Rule is to be *performed* the ſame *Way* and *Manner* as the *Vulgar*, in whole *Numbers* hath been done; only obſerve to put

a

a *Point* or *Comma* betwixt your *Integers* and *decimal Fractions*, to diſtinguiſh the one from the other, when required in any Operation, according to its Caſes.

I. *Caſe.*

When you perform any *Operation* that conſiſts of *Integers* and *decimal Fractions* in the *Multiplicand* and *Multiplier* : In this *Caſe* cut off as many *Figures* in the *Total* thereof, as you have of *decimal Figures* in your *Multiplicand*, and that by putting a *Point* betwixt them, and the *Integers*; and ſo convert them *decimal Fractions* to *Value*, as before directed, according to their *Kinds*.

Example.

Queſt. Multiply 783 *Integers* or *Pounds*, and .432 *decimal Fractions* by 325 *Integers* or *Pounds*. Thus let your Work ſtand.

Multiplicand : : 783.432
Multiplier : : : : 325
3917160
1566864
2350296
l. 254615.400
20
s. 8.000

Anſ. The *total Extent* of 783 *Integers*, and .432 *Decimals* being *multiplied* by 325 *Integers*, will amount to 254615 *Pounds* or *Integers*, and .400 *Decimals*, equal to 254615 Pounds, 8 Shillings.

II. *Caſe*

II. *Caſe*,

Is, when the *Multiplier* conſiſts of *Integers* and *Decimals*, and the *Multiplicand* only of *Integers:* In that Caſe do as before directed, cuting off as many *Figures* by a P*oint* in the *Total*, towards the right Hand, as you have of *decimal Figures* in your *Multplier*.

Queſt. Multiply 38472 *Integers*, or *Ells*, by 34 *Integers* or *Ells*, and .42 *Decimals*. See the Work.

```
                 Multiplicand : 38472 Integers,
                 Multiplier :   : 34.42
                                 -------
                                  76944
                                 153888
                                153888
                               115416
                         -----------------
                         Ells, 1324206.24
                                        4
                                      ---
                                      .96
                                        4
                                      ---
                               Nails, 3.84
```

Anſ. 1324206 *Ells*, .24 *Decimals*, or 1324206 *Integers* or *Ells*, and 3 *Nails*.

III. *Caſe*,

Exc.

Is, when both your *Multiplicand* and *Multiplier* conſiſts of *Integers* and *Decimals*; in that *Caſe* you muſt *point* off as many *Figures* towards the *right Hand* of the *Total* thereof, as you have of *decimal Figures* in both *Multiplicand* and *Multiplier*: See the Work.

Queſt. Multiply 473 *Integers*, and .32 *Decimals*, by 24 *Integers*, and .4 *Decimals*? Thus.

Multiplicand : 473.32
Multiplier : : : 24.4

189328
189328
94664

Integers, 11549.008
Decimals.

Anſ. 11549 *Integers*, and .008 *Decimals.*

I. Example.

Queries, Relative to theſe *preceeding Caſes.*

Queſt. Tell me the *Price* of 7843 *Ells* of *Cloath*, at 4 *Pouuds*, 14 *Shillings per Ell*, or 4 *Integers* or *Pounds* per *Ell*, and .7 *Decimals.* See the Work.

Multiplicand 7843 *Ells* or *Integers*
Multiplier : 4.7

54901
31372

l. 36862.1
20

s. 2.0

Anſ. 7843 *Ells* or *Integers*, will coſt you 36862 *Pounds* or *Integers*, and .1 *Decimal*, equal to 36862 *Pounds*, 2 *Shillings.*

II. Example.

Queſt. Tell me the *Price* of 28 *Pouuds* or *Integers* of *Butter*, at 5 *Shillings*, or .25 *Decimals per Pound* or *Integer.*

Multiplicand : 28
Multiplier : .25

140
56

7.00

Anſ. 28 *Pounds* or *Integers* will coſt you 7 *Pounds* or *Integers*, and 0 *Decimals.*

III. Example.

Queſt. Tell me the *Price* of 843 *Ells* or *Integers* of *Holland* or *Muſline*, at 3 *Pounds* or *Integers*, and 8 *Shillings*, or .4 *Decimals* per *Ell* or *Integer* ?

Multiplicand 843 *Ells*

Multiplier 3.4

3372

Value 2529

l. 2866.2

20

s. 4.0

Anſ. 843 *Ells* or *Integers* of *Holland* will coſt you 2866 *Pounds* or *Integers*, and .2 *Decimals*, or 4 *Shillings*.

IV. Example.

Queſt. Tell me the *Price* of 784 Pairs of *Gloves* or *Integers*, at 14 Shillings, or .7 *Decimals per* Pair.

Multiplicand 784

Muleiplier : .7

l. 548.8

20

s. 16.0

Anſ. 784 Pairs of *Gloves* will coſt you 548 *Pounds* or *Integers*, and .8 *Decimals*, or 16 Shillings.

V. Example.

Queſt. Tell me the *Price* of 472 *Pairs* or *Integers* ef *Stockins*, at 2 *Pounds* or *Integers*, and 8 Shillings, or .4 *Decimals per* Pair or *Integer*.

Multiplicand 472 *Pair,*
Multiplier 2.4
1888
944
l. 1132.8
20
s. 16.0

Anſ. 472 *Pairs,* or *Integers* of *Stockins,* will coſt you 1132 *Pounds* or *Integers,* and 8 *Decimals,* or 16 Shillings.

DIVISION OF DECIMALS.

THis Rule in *Decimals* is done the ſame Way as *Vulgar,* in reſpect to its Method of working; but only conſider theſe following *Caſes,* as they may occur or offer in it. I begin with the firſt *Caſe,* and it is as follows.

I. *Caſe,* Is, when both *Diviſor* and *Dividend* or *ſubject Matter* are *Integers:* In that *Caſe,* after you have divided, or put a Cloſe to your whole *Dividend,* if any Thing *remain,* after the laſt Figure is wrought, put a *Point* to your laſt

Figure in your *Quote*, as a *Sign* that your *Integers* are done ; and next your *Decimals* are to take Place : To which Remainder join a *Cypher*, and then proceed, as before you did with the *Dividend* of whole *Numbers*, until you have 5 or 6 Places filled up of *Decimals* in your *Quote*, (by adding a *Cypher* to your *Remainder*) except it naturally put a Cloſe to it ſelf. See the Example following.

I. Example.

Queſt. Divide 8432 *Integers* or *Pounds* by 34 *Integers* or *Perſons* ? Thus, as before directed.

```
                      Dividend,
Diviſor 34) 8432 (248 Pounds to each,
or Perſons,  68
            ----
             163
             136
            ----
              272
              272
            -----
              ...
```

II. Example.

Queſt. Divide 4320 *Integers* or *Ells* amongſt 7 *Perſons*, or *Integers* ? Thus.

```
                         Ells, Decimals,
Diviſor 7) 4320 (617·14286
           42                 4
          ----         --------
            12           ·57144
             7                4
          ----         --------
            50 nails  2.28576
            49
          ----
                             10
```

```
 10
  7
 ──
 30
 28
 ───
 20
 14
 ───
 60
 56
 ───
  40
  42
 ───
  .2 Exceſs.
```

I find by this foregoing Example, that the *Quote* will amount to 617 *Integers* or *Ells*, and .14286 *Decimals*, equal to 617 *Ells*, and 2 *Nails.*

Explication.

You ſee in the foregoing Example, that I did ask how oft I would find 7 the *Diviſor* in the *Dividend* 43 › and found it to be got 6 Times; which 6 I place in the *Quote:* And after *multiplied* and *ſubſtracted* to its *Remainder* 1, I take down my next *Figure* 2, which make 12 in *Number*, out of which I find my 7 once to be got, which place in the *Quote*, after *multiplying* and *ſubſtracting* the ſame, I find 5 to remain; to which I take down my 0, which is my laſt Figure in whole *Numbers*, being joined with the 5, make 50, out of which I find my 7 (the *Diviſor*) 7 Times, and one to remain; to which I add a *Cypher*, and put a *Point* in my *Quote* (after 7 the laſt *Figure* placed there) and ſo proceed with my *decimal* Places, as you ſee from the *Quote*, until I arrive at 5 *Places* therein; at which Time take the *Diviſor* 7 once more than it can be found, marking the *Exceſs* of the ſame, ſtill annexing a *Cypher* to the *Remainder* of each (as before directed) untill I have taken this *Exceſs*; by Reaſon of which, I put a ſpeedy Concluſion to the ſame.

Now, as with this Example, ſo with all others belonging to ſuch a *Caſe* as this.

II. *Caſe* is, when your *Diviſor* conſiſt of *Integers* and *decimal Fractions*, and your *Dividend* only of *Integers*. In that *Caſe*, you muſt (before you proceed to work the ſame) affix as many *Cyphers* to your *Dividend* of *Integers*, as you have of *decimal* Places or *Figures* in your *Diviſor*; and after that is done, proceed as before with the foregoing *Example*; for as many *Cyphers* as you affix to the *Dividend*, will be in Stead of ſo many *Integers*: So that it is plain, after Diviſion thereof, your *Quote* will be *Integers*; to which Remainder annex a *Cypher*, and at the ſame Time put a Point in the *Quote*, and proceed with the *decimal* Places, as before directed.

I. Example.

Queſt. Divide 454 Pounds or *Integers* by 4.5 *Integers* and *Decimals*? Thus,

l.

Diviſor 4.5) 4540 (100.889
45 20

Anſ. The *Share* will be 160 *Integers* or *Pounds*, and 889 *Decimals*, or 17 *Shillings*, 9 *Pennies*, 1 *Quarter*.

.400 *s.* 17.780
360 12
.400 1560
360 780
.400 *d.* 9.360
405 4
Exc. 5 *qrs.* 1.440
Exceſs

II. Example:

Queſt. Divide 496 *Integers* or *Ells*, by 4.32 *Integers* and *Decimals*? Thus.

Ells,
Diviſor 4.32) 496.00 (114.815
432 4
.640 *qrs.* 3.260
422 4
2080 *Nails* 1.040
1728
.3520
2456
. .640
422
2080
2160
. . 80 *Exceſs*

Nota, The Reaſon of *adding* or *affixing* theſe *Cyphers* to theſe *Integers* in the *Dividend*, is to make the *Diviſor* and *Dividend* run in an equal *Channel*, agreeable to their reſpective *Value*.

III. *Caſe* is, when your *Dividend* conſiſt of of *Integers* and *decimal Fractions*, and your *Diviſor* only of intire and whole *Numbers*. Where that *Caſe* occurs, you muſt annex as many *Cyphers* to your *Diviſor*, or *Integers* therein, in, as you have of *decimal* Places or *Figures* in your *Dividend* · Yet for all that, your *Figures* in the *Quote* will be *Integers*, until all your *Figures* in the *Dividend* be wrought up; and after that is done, join a *Cypher* to your *Remainder*, and at the ſame Time put a P*oint* in the *Quote*, betwixt the *Integers* there already, and the *Decimals* that are to follow; and ſo proceed, as before directed.

I: Example.

Queſt. Divide 784 *Integers* or *Pounds*, and .75 *Decimals* by 34 *Integers* or *Perſons*?

```
Diviſor 34.00) 784.75   ( 23.080882353
               6800                   20
               10475      s. 1.617647060
               10200                  12
               ..27500       1235294120
                 27200       617647060
                 ..30000  d. 7.411764720
                   27200               4
                   .28000 qr.1.647058880
                    27200
                    ..8000
                      6800
                     12000
                     10200
                      18000
                      17000
                       10000
                       10200
                       ..200 Exceſs
```

IV. *Caſe* is, where the *Diviſor* conſiſt of *Integers*, and the *Dividend* of *decimal Fractions*. In that *Caſe* you muſt divide them *Fractions* after the common Rate of *Diviſion* in *Integers*; and yet your *Quote* will be *decimal Fractions*, as clear from the Operation.

Queſt. Divide .78432 *decimal Fractions* of *Ells*, by 43 *Integers*? Thus.

```
43) .78432 (.1824
     43.          4
    ----      -----
     354       7296
     344 Nails    4
    ----     ------
     .103    2.9184
      86
     ---
      172
      172
     ---
      ...
```

Anſ. Their *Share* will be .1824 *Decimals*, or 2 *Nails*, and .9184 of *Exceſs*.

V. *Caſe* is, where both *Diviſor* and *Dividend* conſiſt of *Integers* and *decimal Fractions*. In that *Caſe* you muſt work up as many *decimal Fractions* in your *Dividend*, as you have of *decimal Fractions* in your *Diviſor* [illegible] *Quote* will be *Integers*:) A[illegible] up (if more *Decimals* than [illegible] you muſt mark what follows as *Decimals*.

I. Example.

Queſt Divide 843 *Integers*, and .32 *Decimals* by 32.4 *Integers* and *Decimals*? thus.

32.4)

32.4) 843.32 (26.02839815
648
1953
1944
...920
648
2720
2592
.1280
972
308

3080
2816
.2640
2592
..480
324
1560
1620
..60 *Exceſs*

Anſ. 26 *Integers*, and .02839815 *Decimls.*

VI. *Caſe* is, where the *Diviſor* conſiſt of *Fractions*, and the *Dividend Integers*. In that *Caſe*, you muſt annex as many *Cyphers* to your *Dividend*, as you have *Decimals* in your *Diviſor*; yet your *Quote* will be *Integers*: After theſe are wrought up, the following will be *decimal Fractions*.

Example.

Queſt. Divide 4325 *Integers* by .32 *Decimals*? Thus.

.32.) 432500 (13515.625
32

.96
.165
160
..50
32

Anſ. 13515 *Integers*, and .625 *Decimals* to their *Share*.

```
 180
 160
 ----
 .200
  192
 -----
 ..80
    64
   ----
   160
   160
   ----
   ...
```

Example.

VII. and Laſt *Caſe* is, where the *Diviſor* and *Dividend* both conſiſt of *Decimals.* In that *Caſe* work as in common *Diviſion*, and yet your *Quote* will alſo be *Decimals*, as clear from the Examples following.

Queſt. Divide .8432 *Decimals*, by .43 *Decimals.* Thus,

```
.43) .8432 (.1960930234
      43..          .
     ----
     413
     287
     ----
     .262        Anſ. 1.1960930234
      258             Decimals to each
     ----             Share.
     ..400
       387
      -----
      .130 .
       129
      -----
      ..100
         86
      -----
```

```
 140
 126
 .140
  172
  .32 Exceſs.
```

Some *practical* EXAMPLES.

I. Example.

Queſt. Divide 84325 *Integers* or *Pounds*, and .6 *Decimals*, or 12 *Shillings* amongſt 12 *Integers* or *Perſons* at Work? Thus.

```
12) 84325.6 ( 7027.13334
    84..          .        20
    ..32          s. 2.66680
      24                   12
      .85            133360
       84             66680
       .16        d. 8.00160
        12
       .40
        36
       .40
        36
         40
         36
          40
          48
           8 Exceſs.
```

Anſ. Each hath 7027 *Integers*, and .13334 *Decimals*, equal to 7027 *Pounds*, 2 *Shillings*, 8 *Pennies.*

II. Example.

Queſt. Divide 85643 *Ells* or *Integers*, and 3 *Quarters*, 2 *Nails* of *Cloath*, or .875 *Decimals* amongſt 438 *Integers*, or *Perſons*? Thus.

```
438) 85643.875 (195.53396119
     438                      4
     ----        ----------------
     4184        qrs. 2.13584476
     3942                     4
     ----        ----------------
      2423            .54337904
      2190              Exceſs.
      ----
       2338
       2190
       ----
        1487
        1314
        ----
         1735
         1314
         ----
          4210
          3942
          ----
           2680
           2628
           ----
             520
             438
             ---
              820
              438
              ----
              3820
              3942
              ----
               122  Exceſs.
```

Anſ. Eaeh hath 195 *Ells*, 2 *Quarters*, equal to 195 *Integers*, and .53396119

These Queſtions following are performed as the foregoing Examples are, with the Help of a *Maſter*.

Queſt. Divide 4325003 *Integers* or *Glebes*, and 3 *Acres*, or .75 *Decimals* of *Land* amongſt 312 *Integers*, or *Creditors?* Thus.

312.) 4325003.75 (

Queſt. Divide 783283 *Hogſheads* or *Integers*, and 12 *Gallons*, 4 *Pints*; or .78125 *Decimals* amongſt 212 *Creditors?* Thus.

212) 783283.78125 (

Queſt. Divide 843256 *Stones* or *Integers*, and 12 *Pounds*, 8 *Ounces*, or .78125 *Decimals* amongſt 434 *Creditors?* Thus.

434) 843256.78125 (

Queſt. Divide 735600 *Chalders* or *Integers*, and 10 *Bolls*, 2 *Firlots* of *Barley*, or .65625 *Decimals* amongſt 218 *Merchants?*.

218) 735600.65625 (

Queſt. Divide 976432 *Pounds* or *Integers*, and 8 *Ounces* of *Drugs*, or .5 *Decimals* amongſt 732 *Apothecaries?*

732) 976432.5 (

Queſt. Divide 876432 *Pounds* or *Integers*, and 10 *Ounces* of *Wheat*, or .83334 *Decimals* amongſt 39 *Baxters* or *Integers?*

39) 876432.83334 (

REDUCTION
IN
DECIMALS.

THis *Rule* is performed as the *Vulgar*, only conſider the *Caſes* of *Multiplication* and *Diviſion*, as they occur.

Queſt. Reduce 78976 *Guineas* or *Integers* to Pounds *Scots* or *Integers*? Thus. Conſider, that in one *Guinea* there are 12 *Pounds* or *Integers*, and 12 *Shillings*, or .6 *Decimals*. See the Work.

```
 78976 Guineas,
   12.6
 ------
 473856
157952
78976
-------
995097.6
      20
   -----
 s. 12.0
```

Anſ. In theſe *Guineas* there are 995097 *Pounds* or *Integers*, and .6 *Decimals*, equal to 12 *Shillings*.

Nota, More of theſe Examples might be wrought; but the *Vulgar* performs them as eaſily.

Queſt. Multiply 6 *Pounds*, 6 *Pennies*, or 6 *Pounds* or *Integers*, and 6 *Shillings*, 6 *Pennies*, or .325 *Decimals*, by 6 *Pounds* or *Integers*, and 6 *Shillings*, 6 *Pennies*, or .325 *Decimals?* See the Work.

```
     6.325
     6.325
   -------
     31625
    12650
   18975
  37950
 ----------
l.40.005625
        20
   -------
    112500
        12
   -------
    225000
   112500
   -------
d. 1.350000
```

In the ſame 40 *Pounds* or *Integers*, and .005625 *Decimals*. or 1 *Penny*.

Rule of THREE direct

IN

DECIMALS.

THis *Rule* is performed as the *Vulgar* only, conſider the *Caſes* of *Multiplication* and *Diviſion*, as they occur.

Queſt. If 8 *Integers* or *Ells*, and 3 *Quarters*, or .75 *Decimals* coſt me 28 *Pounds* or *Integers*, and 18 *Shilliugs*, or .9 *Decimals*, what will 48 *Ells* or *Integcrs* thereof coſt me, if I ſhould incline to buy it? Thus.

```
If 8.75—28.9  What 48?
              48
            ----
            2312
           1156          Int.      Deci.
          -------
8.75) 1387.20          (158.53714286
       875                        20
       ----            -------------
       5122            s. 10.74285720
       4375 Value                 12
       ----            -------------
       7470              148571440
       7000               74285720
       ----            -------------
        4700           d. 8.91428640
        4375                       4
        ----           -------------
         3250        qrs. 3.65714560
         2625                Exceſs.
         ----
         6250
         6125
         ----
          1250
           875
          ----
          3750
          3500
          ----
           2500
           1750
           ----
           7500
           7000
           ----
            5000
            5250
            ----
             250 Exceſs.
                              Anſ.
```

Anſ. 48 *Ells* or *Integers* will coſt you 158 *Pounds* or *Integers*, and .53714286 *Decimals*, equal to 10 *Shillings*, 8 *Pennies*, 3 *Farthings*. See the Work agreeable to the *Vulgar*.

II. Example.

Queſt. Tell me what I muſt pay for 484 *Nolt* or *Integers*, if 28 of the ſame *Nolt* or *Integers* coſt me 382 *Pounds* or *Integers*, and 12 *Shillings*, or .6 *Decimals*? Thus.

```
          If 28—382.6—qt. 484
              484
          -------
            15304
           30608
          15304             Int.      Deci.
          -------
    28.0) 1851784           (6613.51428572
          168  Value                    20
          ---               --------------
           171              s. 10.28571440
           168                          12
           ---                    --------
             37                   57142880
             28                  28571440
            ---              -------------
              98             d. 3.42857280
              84                         4
             ---             -------------
              144          qrs. 1.71429120
              140                 Exceſs.
              ---
                40
                28
                ---
                120
                112
                ---
                  80
                  56
```

240
224
160
140
200
196
40
56
16 *Exceſs.*

Anſ. 484 *Nolt* will coſt you 6613 *Pounds* or *Integers*, and .51428572 *Decimals*, equal to 10 *Shillings*, 3 *Pennies*, 1 *Quarter.*

Nota, As you ſee theſe 2 foregoing Examples done, ſo perform the following Examples; all of them being tabled for your *Operation.*

III. Example.

Queſt. If I be to give for 48 *Sheep*, 118 *Pounds* or *Integers*, and 14 *Shillings*, 4 *Pennies*, or .7167 *Decimals*, What muſt I pay for 232 *Sheep* of the ſame *Kind?* Thus.

If 48— 118.7167— *qt* 232
222

IV. Example.

Queſt. Tell me what I muſt pay for 18 *Chalders* or *Integers*, and 12 *Bolls*, 2 *Firlots* of *Barley* or *Wheat*, or .78125 *Decimals*; there being paid for 4 *Chalders* thereof 420 *Pounds* or *Integers*, and 12 *Shillings*, or 6 *Decimals*? Thus.

If 4— 420.6— *qt.* 18.78125
420.6

V. Example.

Queſt. Tell me what I muſt pay for 98 *Hogſheads*, 12 *Gallons* of *Wine*, or .75 *Decimals*, if 14 *Hogſheads* of the ſame *Wine* coſt me 4328 *Pounds*, and 14 *Shillings*, or .7 *Decimals*? Thus.

If 14— 4328.7— *qt* 98.75

98.75

VI. Example.

Queſt. Tell me what 58 *Glebes* will coſt me, if 12 *Glebes*, and .75 *Decimals* thereof coſt me 7324 *Pounds*, .7 *Decimals*? Thus.

If 12.75— 7324.7— *qt.* 58

58

VII. Example.

Queſt. Tell me the *Price* of 348 *Pounds* of *Drugs*, if 48 *Pounds*, .625 *Decimals* thereof coſt 128 *Pounds*, .6167 *Decimals*? Thus.

If 48.625— 128.6167— *qt.* 348

248

VIII. Example.

Queſt. I demand the *Price* of 58 *Firkins* of *Soap*, at the Rate of 56 *Pounds*, and .9 *Decimals* for 8 of the ſame *Firkins*?

If 8— 56.9— *qt.* 58

58

IX. Example.

Queſt. If I pay for the Carriage of 4 *Packs* of *Wooll* from *Edinburgh* to *Dalkeith*, being 4 *Miles*, 2 *Pounds*, and .4 *Decimals*, What will I pay for them to *Stirling*, being 24 *Miles*? Thus.

If 4— 2.4— *qt.* 24

24

RULE OF THREE indirect.

THis *Rule* is performed as the *Vulgar*, after underſtanding the placing of it according to its *Terms* and *Caſes* of *Multiplication* and *Diviſion*, as before expreſt.

I Example.

Queſt. If 8 *Men* conſume in 2 *Months*, 2 *Weeks*, or .20867 *Decimals* of *Time*, 138 *Pounds*, how ſoon will 48 *Men* conſume the ſame? Thus.

If 8— .20867— *qt.* 48

8	*Decimals,*
48) 166936	(.0347784
144	12
229	*Value* 695568
192	347784
373	.4173408
336	4
376	*Weeks* 1.6693632
336	7
400	*Days* 4.6855424
384	24
160	27421696
192	13710848
Ex. 32	*ho.* 16.4530176
	60
	m. 7.181056_0

Anſ. 48 *Men* will ſpend that 138 *Pounds* in 1 *Week*, 4 *Days*, 16 *Hours*, and 27 *Minutes*, or .0347784 *Decimals* of *Time*.

Queſt. If 28 *Shearers* cut down theſe Fields of *Corn* in 1 *Month*, 2 *Weeks*, or .12507 *Decimals* of *Time*, how ſoon will 48 *Shearers* (if employed) cut them down?

If 28— .12507— *qt*. 48

28

100056

25014

48) 35.0196 (.0729575

336

141

96

459

432

276

240

360

336

240

240

... *Hours*

Deci.

.0729575

12

Value 1459150

729575

8754900

4

Weeks 3.5019600

7

Days 3.5137200

24

20548800

10274400

Hours 12.3292800

60

Minutes 19.7568000

Anſ. 48 *Men* will cut that Field down in 3 *Weeks*, 3 *Days*, 12 *Hours*, and .19 *Minutes*, or .0729575 *Decimals* of *Time*.

Now as theſe are performed, ſo are the following Examples, or any others belonging to this Rule.

III. Example.

Queſt. Tell me how ſoon 732 *Men* employed will caſt theſe *Trenches,* which took 219 *Men* 4 *Days,* 6 *Hours,* or .00193452382 *Decimals ?*

If 219—.00193452382— *qt.* 732
219

IV Example.

Queſt. Tell me how ſoon 148 *Horſes* will be in conſuming theſe *Oats* and *Hay,* which would ſerve 48 *Horſes* 9 *Months,* 3 *Weeks,* or .8125 *Decimals* of *Time ?*

If 48— .8125— *qt.* 148
48

V. Example.

Queſt. Tell me how ſoon 64 *Taylors* will mount theſe *Regiments,* conſiſting of 3848 *Men,* if 28 *Taylors* formerly mounted them in 9 *Months,* 3 *Weeks,* 4 *Days,* or .8136904762 *Decimals ?*

If 28—.8136904762— *qt.* 64.
28

VI. Example.

Queſt. If a *Weaver* that works but 6 Hours, a *Day,* or .00074404762 *Decimals,* put out his *Web* in 8 Days, or .0023809 24 *Decimals* of *Time,* how ſoon will one that works 12 Hours of a Day, or .00148809504 *Decimals* ? Thus.

If .00074404762 .0023809524 *qt.* .00148809504
.00074404762

VII. Example.

Queſt. If 18 *Maſons* build a *Park Dyke*, conſiſting of 3254 *Roods*, in 4 *Months*, or .3334 *Decimals*, how ſoon will 38 *Maſons* build the ſame, if employed? Thus.

Maſons, *Maſons*,
If 18—— .3334— *qt.* 38
18

RULE of THREE compound.

AS I ſaid in the two foregoing *Rules*, the *Terms* are the ſame with the *Vulgar*; but only conſider the *Caſes* of *Multiplication* and *Diviſion*, as you have Opportunity for them. Therefore I proceed immediately to the Operations.

I. Example.

Queſt. If 18 *Men* ſpend 84 *Pounds* or *Integers*, and 12 *Shlllings*, or .6 *Decimals* in 4 *Months*, 2 *Weeks*, or .37507 *Decimals*, what will ſerve (after that Way of Living) 38 *Men* 9 *Months*, or .75 *Decimals*. Table it thus as the *Vulgar*.

Men, *l. deci.*
If 18—.37507—84.6—qt. 38.75
18 .75
300056 190
37507 266
6.75126 2850
84.6
17100
11400
22800
6.75126) 2411.10000 (357.13334
2025378 20
3857220 s. 2.66680
3275630 *Value* 12
4815900 132760
4725882 66680
900180 d. 8.00160
675126 4
2250540 .02640
2025378 *Exceſs*
2251620
2095378
2252420
2025378
2370420
2700504
330084 *Exceſs*

Anſ. 38 *Men* will ſpend in 9 Month's Time, after that Way of Living, 357 *Pounds*, and .13334 *Decimals*, equal to 2 *Shillings*, 8 *Pennies*.

II. Ex-

II. Example.

Theſe Examples ſollowing I leave to the Learner to perform himſelf.

Queſt. Tell me what will ſerve 48 *Horſes* 6 *Months*, 3 *Weeks*, or .5625 *Decimals*, if 28 *Horſes* conſume 4 *Chalders*, 3 *Bolls*, or .1875 *Decimals* in 8 *Months*, or .6667 *Decimals?*

Horſes, Deci. Chal Deci. Horſes, Deci.
If 28—.6667—4.1875—*qt.*—48—.5625
28 48

III. Example.

Queſt. If my Family, conſiſting of 16 *Perſons* do ſpend in 2 *Years*, 4 *Months*, or .3334 *Decimals*, 12 *Chalders*, 4 *Bolls*, or .25 *Decimals* of *Meal*, what will ſerve (if I ſhould incline to augment their Number) 45 *Perſons* 3 *Years?* Thus.

per. y. deci. cha. deci. per. years
If 16— 2.3334— 12.25—*qt.* 45—3
16 3

IV. Example.

Queſt. What will ſerve theſe *Regiments* or *Army*, conſiſting of 42324 *Men*, to go againſt an *Enemy*, for 4 *Years*, 6 *Months*, or .5 *Decimals*, if an *Army* couſiſting of 14328 took to maintain them when they went againſt their *Enemy* 2478342 *Pounds*, 18 *Shillings*, or .9 *Decimals* for 3 *Years* Space? Thus table it.

Men, years, l. deci. men, y.d.
If 14328—3— 2478342.9—*qt.* 42324—4.5
3 45

V. Ex-

V. Example.

Queſt. Tell me how much 48 *Maſons* will build in 4 Months, 2 Weeks, or .37507 *Decimals*, if 16 *Maſons* build 384 *Roods* in 5 Months, or .41667 *Decimals?*

Ma. *Deci.* *Roods,* *Ma.* *Deci.*
If 16—.41667— 384—*qt.* 48— 37507
16 48

VI. Example.

Queſt. If 16 *Weavers* in a Factory work 472 Ells, 3 Quarters, or .75 *Decimals* of ſailing Cloath in 6 Months, 3 Weeks, or .5625 *Decimals*, What will 38 *Weavers* do (if I ſhould employ them) in 8 Month's Time, or .6667 *Decimals?*

Wea. *Deci.* *Ells, deci.* *w.* *deci.*
If 16—.5625—472.75—*qt.* 38—.6667
16 38

So much for perambulatory *Queries*, now I advance ſome *Queries* upon Intereſt of Money.

Intereſt of MONEY.

Queſt. I Demand the Intereſt of 732 Pounds, 14 Shillings, or .7 *Decimals* for 6 Years, 3 Months, or .25 *Decimals*, at 5 Pounds, 10 Shillings, or .5 *Decimals per Cent. per annum.* See the Work.

```
     l.     y.   l. s.
If 100—1.—5.5 qt. 732.7—6.25
                       6.25
                      36635
                     14654
                    43962
                    4579.375
                         5.5
                    22896875
                   22896875                  l.    deci.
          100). 25186.5625 (           251.865625
                200                            20
                 518                  s. 17.312500
                 500                           12
                  186                      625000
                  100                     312500
                   865                 d. 3.750000
                   800                          4
                    656              qrs. 3.000000
                    600
                     562
                     500
                      625
                      600
                       250
                       200
                        500
                        500
                        ...
```

Anſ. The Intereſt of 732 Pounds, 14 Shillings, or .7 *Decimals* in 6 Years, 3 Months will amount to 251 Pounds, and .865625 *Decimals*, equal to 17 Shillings, 3 Pennies, 2 Quarters.

II. Example.

Queſt. Tell me the *Intereſt* of 100 Pounds or *Integers* for 1 Year, if 732 Pounds, 14 Shillings, or .7 *Decimals* yield me of *Intereſt* in 6 Years, 3 Months, or .25 *Decimals*, 251 Pounds, 17 Shillings, 3 Pennies, 3 Quarters, or .865625 *Decimals* ?

l. *y. deci.* *l.* *deci.* *l.* *y.*
If 7327—6.25—251.865625—*qt.* 100—1
6.25 1

Perform the ſame as the foregoing Example, and your Anſwer will be of *Intereſt* 5 Pounds, 10 Shillings, or .5 *Decimals.*

III. Example.

Queſt. Tell me the *Intereſt* of 2000 Pounds, 8 Shillings, or .4 *Decimals* for 5 Years, 4 Months, or .3334 *Decimals* at 5 Pounds or *Integers per Cent. per annum* ?

l. *y.* *l.* *l. deci.* *y. deci.*
If 100—1—5—*qt.* 2000.4—5.3334
1 5.3334

Intereſt by various *Acts* of PARLIAMENT.

Queſt. Tell me the *Intereſt* of 648 Pounds, 12 Shillings, or .6 *Decimals*, for 8 Years, 4 Months, or .3334 *Decimals*, at

1mo. 5 Pounds *per Cent. per annum* by *Act* of *Parliament* for 2 Years thereof.

2do. At 5 Pounds, 10 Shillings, or .5 *Decimals per Cent. per annum* by *Act* foreſaid, for 2 Years, 2 Months, or .1667 *Decimals*

3tio. At 6 Pounds *per Cent. per annum* for 2 Years, 8 Months, or .6667 by *Act* foreſaid.

4to. At 5 Pounds, 10 Shillings, or .5 *Decimals per Cent. per annum* by *Act* foreſaid, for 1 Year, 6 Months, or .5 *Decimals.*

Nota, In performing this *Query*, or any like it, work them as the preceeding *Examples*; but obſerve to add Dates that are for the ſame *Intereſt* together, ſo as you may make but one *Operation*, as in this Example.

I. *Operation*, thus.

```
       l.      y.   l.        l. deci  y.
If   100 —— 1 —— 5 —— qt. 648.6 —— 2
       1                        2
    ----                  ---------
     100                   1297.2
                                5
                      ------------
                      l. 64.860
                             20
                       ----------
                      s. 17.200
                             12
                       ----------
                      d. 2.400
                              4
                       ----------
                     qrs. 1.600
                         Exceſs.
```

1ſt Moiety's *Intereſt* for 2 Years, is 64 *Pounds*, and .860 *Decimals*, equal to 17 *Shillings*, 2 *Pennies*, 1 *Quarter* in *Value.*

II. *Ope-*

II. *Operation.*

Nota, The ſecond and fourth are added together, to wit, their *Time*, becauſe they are for the ſame *Intereſt* the one with the other, as clear from the *Query* it ſelf; the ſecond is 5 Pounds, 10 Shillings for 2 Years, 2 Months; the fourth is 5 Pounds, 10 Shillings for 1 Year, 6 Months; being added together, make 3 Years, 8 Months, equal to 3 Years or *Integers*, and .6667 *Decimals*. Thus.

l. *y.* *l. deci.* *l. deci.* *y.* *deci.*
If 100—1—5.5— *qt.* 648.6—3.6667
1 3.6667
100 45402
38916
38916
38916
19458
237822162
5.5
1189110810
1189110810
l. 130.80218910
20
s. 16.04378200
12
08756400
04378200
d. 0.52538400
4
qrs. 2.10153600 *Exceſs.*

2d Moiety's *Intereſt* for 3 Years, and .6667 *Decimals*, is 130 Pounds, and .80218910 *Decimals*, equal to 16 Shillings, 2 Farthings.

III. *Operation.*

l. *y.* *l. deci.* *l.* *deci.* *y.* *deci.*
If 100— 1— 6—*qt* 648.6— 2.6667

$\frac{1}{100}$ 2.6667

45402
38916
38916
38916
12972
1729.62162
6
l. 103.7772972
20
s. 15.5459440
12
10918880
5459440
d. 6.5513280
4
qrs. 2.1053120 *Exceſs.*

3d. Moiety's *Intereſt* for 2 Years, and .6667 *Decimals*, is 103 *Pounds*, and .7772972 *Decimals*, equal to 15 *Shillings*, 6 *Pennies*, 2 *Farthings*.

Total,	*l. deci.*
1ſt Moiety's *Intereſt* is : :	64.860 . . . .
2d Moiety's *Intereſt* is :	130.80218910
3d Moiety's *Intereſt* is : :	103.7772972
Total Intereſt is : :	299.43948630

Nota, As 5 *Pounds*, 5 *Decimals*, and 6 *Pounds*, are equal to one Year's *Intereſt* of 100 Pounds Principal, ſo will 299 Pounds, and .43948630 *Decimals* be found equal in proportional *Intereſt* to 648 Pounds, and 6 *Decimals* of Principal for 8 Years, and .3334 *Decimals* of *Time*, at the ſame *Intereſt*.

Now as this is done, ſo perform all others according to this *Kind*.

Intereſt *bearing* Intereſt *each Year, as well as Principal.*

Queſt. Tell me the *Intereſt* of 344 Pounds, 12 Shillings (*Intereſt* bearing *Intereſt* as well as *Principal* each Year) for 4 Years, at 5 Pounds, 10 Shillings, or 5 Pounds, .5 *Decimals per Cent. per annum* each Year? Perform this *Query* as you did the foregoing Example; but only add the *Intereſt* coming thereof to the *Principal*, and of their *Total* make your *Principal* next or ſecond Year, and ſo on, till done with the 4 Years demanded.

l. *y.* *l. deci.* *l. deci.* *y.*
If 100 — 1 — 5.5 — *qt.* 344.6 — 1
5
l. 17.230
20
s. 4.600
12
d. 7.200
4
800 *Exceſs*

Int. deci.
The *principal Sum* is : : : 344.6
The *Intereſt* thereof firſt Year is 17.230
Total of *Principal* and *Intereſt* 361.830 for a 2d *Operation.*

l. *y.* *l.* *l. deci.* *y.*
If 100— 1— 5— *qt.* 361.830— 1
5
l. 18.09150
20
s. 1.83000
12
166000
83000
d. 9.96000
4
qrs. 3.84000
Exceſs.

The *principal Sum* 2d Year : 361.830
The *Intereſt* thereof for the 2d Year 18.09150
Total of *Principal* and *Intereſt* is 379.92150 for a 3d *Operation.*

l. *y.* *l.* *l. deci.* *y.*
If 100— 1— 5— *qt.* 379.92150— 1
1
100
5
l. 18.9960750
20
s. 19.9215000

s. 19.9215000
12
18430000
9215000
d. 11.0580000
4
2320000 *Exceſs.*

The *principal Sum* the 3d Year is 379.92150
Intereſt thereof for that Year is 18.9960750
Tot. of *Prin.* and *Intereſt* 3d Year is 398.9175750

For a 4th *Operation.*

l. *y.* *l:* *y.*
If 100— 1— 5— *qt.* 398.9175750— 1
1 5
100 *l.* 19.945878750
20
s. 18.917575000
12
1835150000
917575000
d. 11.010900000
4
.043600000 *Exc.*

Principal Sum the 4th Year is 398.9175750
Intereſt thereof for that Year is 19.945878750
Tot. of *Prin.* and *Intereſt* 4th Year 418.863453750

Anſ. The *Total* of *Principal* and *Intereſt* for 4 Years being cumulate *Principal* with *Intereſt* each Year, will amount to 418 Pounds, and .863453750 *Decimals.*

Nota, To perform any other like unto this, obſerve the ſame Method, and you will perform aright, otherwiſe not right.

II. Example.

Queſt. Tell me the *Intereſt* of 218 Pounds for 3 Years (*Intereſt* bearing *Intereſt as* well as *Principal* each Year) at 6 Pounds *per Cent. per annum?* Do herein as before directed in the foregoing Example, ſaying,

l. *y.* *l.* *l* *y.*
If 100— 1— 6— *qt.* 218— 1
6

Single FELLOWSHIP in Decimals.

THis *Rule*, as I ſaid before, is performed the ſame Way as the *Vulgar*; only conſider the *Terms* thereof, and the *Caſes* of *Multiplication* and *Diviſion* in *Decimal* Operations.

I. Example.

Queſt.. *A. B. C* entred into *Company*, to trade together for *Loſs* and *Gain*; into which *Stock A.* gave 318 *Pounds*, and 14 *Shillings*, or .7 *Decimals*. *B.* gave 493 *Pounds*, 12 *Shillings*, or .6 *Decimals*. *C.* gave 632 *Pounds*, 8 *Shillings*, or .4 *Decimals*. At a codvenient Time thereafter meeting together for *Clearance* of Accounts, they found themſelves to have gained by their trading 2784 *Pounds*, 16 *Shillings*, or .8 *Decimals*. Now

I

I demand each *Man's Share* thereof, according to their *Stocks* given in at firſt for trading.

ſay,

A. *Stocks,* *Gain,* *1ſt Man's*
A. 318.7 If 1444.7—2784.8—*qt.* 318.7
B. 493.6 318.7
C. 632.4 194936
Tot. 1444.7 *Stocks* 222784
27848
83544
1444.7) 887515.76 (614.3252994
86682
20695
14447
62487
57788
46996
43341
36550
28894
76560
72225
43250
28894
143560
130023
135370
130023
53470
57788
l. 4318 *Exc.*

A's Part will be 614.3252994 *Deci.* and *Ex.* 4318

B's If 1444.7 — 2784.8 — qt. 493.6
493.6
167088
83544
250632
111392
1444.7) 1374577.28 (951.46208902
130023
74347
72235
21122
14447
66758
57788
89700
86682
30180
28894
128600
115576
130240
130023
21700
28894
7194
Exceſs.

l.
B's Part will be 951.46208902 *Decimals*, and *Exceſs* 7194

If

C's If 1444.7— 2784.8— *qt.* 632.4

```
                    632.4
                  -------
                   111392
                  55696
                 83544
                167088
               ----------
1444.7) 1761107.52 (1219.012612
        14447
        -----
         31640
         28894
         ------
          27467
          14447
         -------
          130205
          130023
          --------
              18220
              14447
             -------
               37730
               28894
              -------
                88360
                86682
                -------
                 16780
                 14447
                 -------
                  23330
                  28894
                 -------
       1.          5564 Exceſs.
```

C's Part will be 1219.012612 *Decimals*, and Exceſs 5564

A's Share is found to be : .614.3252994

B's Share is found to be : .951.46208902

C's Share is found to be : 1219.012612

Total Gain : : 2784.80000042

Now as their particular *Stocks* have Proportion to the *total Stock* given in by all, ſo it will be found that their particular *Shares* of *Gain* will bear the ſame *Relation* to the *total Gain*, as clear from the Work.

Nota, As you perform this preceeding Example, ſo follow the ſame *Method* in working all others belonging to this *Rule*. I give you ſome Examples for Trial.

Queſt. *A. B. C. D.* Four young Men entred into Company with one another, for trading upon ſeveral *Materials*: Into which *Stock A.* gave 209 Pounds, *B.* gave 312 Pounds, 12 Shillings, or .6 *Decimals*, *C* gave 208 Pounds, and *D.* gave 219 Pounds, 14 Shillings, or .7 *Decimals*; and by their trading they gained 798 Pounds, 14 Shillings, or .7 *Decimals*. Now I demand their *Share* according to their *Stocks* given in? Table it thus.

	l. deci.		*l.*	*d.* ſay, *gain,*		*l.*
A.	209.0	*A.* If	949.3—	798.7	*qt.*	209.0
B.	312.6			209		
C.	208.0	*B.* If	949.3—	798.7	*qt.*	312.6
D.	219.7			312.6		
To. Stock	949.3	*C.* If	949.3—	798.7	*qt.*	208.0
				208		
		D. If	949.3—	798.7	*qt.*	219.7
				219.7		

Queſt. I demand what *Share A. D.* theſe 2 Perſons (having joined their *Stocks* together for trading) have in the *Gain* of 7324 Pounds, 18

18 Shillings, or .9 *Decimals*, *A.* having given in 419 Pounds, 12 Shillings, or .6 *Decimals*, and *D.* gave in 738 Pounds, 8 Shillings, or .4 *Decimals*? Thus.

	l. deci.		*l.* ſay,	*l. deci.*		*l. d.*
A.	419.6	*A.* If	1158.0—	7324.9	*qt.*	419.6
D.	738.4			419.6		
Tot.Sto.	1158.0	*D.* If	1158.0—	7324.9	*qt.*	738.4
				738.4		

Double FELLOWSHIP in Decimals.

IT is the ſame Way done as the *Vulgar*, only the *Caſes* of *Multiplication* and *Diviſion* are to be conſidered:

I. Example.

Queſt. A. B. C. theſe three Perſons went to trade together into Company for ſome Time; into which *Stock A.* gave 112 Pounds for 4 Years, 4 Months, or .3334 *Decimals*; *B.* gave 219 Pounds, 10 Shillings, or .5 *Decimals* for 5 Years; and *C.* gave 174 Pounds, 4 Shillings, or .2 *Decimals* for 6 Years, 2 Months, or .1667 *Decimals*. And at Length they gained upon their trading 3254 Pounds, 14 Shillings, or .7 *Decimals*. Now I demand their *Share*, according to their different *Stocks*, and *Time* of trading? Thus.

l. y. deci.	*l. d. y.*	*l. deci. y.*
A. 112.4.3334	*B.* 219.55	C. 174.2—6:1667
112	5	174.2
86668	*B*'s 1097.5	123334
43334		246668
43334		431669
A's 485.3408		61667
		1074.23914

A's *Total* is —— 485.3408

B's *Total* is —— 1097.5 ....

C's *Total* is —— 1071.22914

Total Stock —— 2657.07994

For a *Diviſor*

I. *Operation.*

A's Part If 2657.07994 — 3254.7 *qt.* 485.3408

485.3408

260376

130188

97641

162725

260376

130188

2657.07994) 1579638.7076 (594.5017604

1328539970

2510987317

2391371946

1196153716

1062831976

1333217400

1333217400
1328539970
467743000
265707994
2020350060
1859955958
1603941020
1594247964
969305600
1062831976
93526376 *Exc.*

l. *deci.* *l.* *deci.* *l.* *deci.*
B's If 2657.07994—3254.7— *qt.* 1097.5
1097.5
162735
227829
292923
32547

l *deci.* *l.* *deci.*
2657.07994) 3572033.25000 (1344.34542079
265707994
914953310
797123982
1178293280
1062831976
1154613040
1062831976
917810640
797123982
1206866580

1206866580
1062831976

1440346040
1328539970

1118060700
1062831976

552287240
531415988

2087125200
1859955958

2271692420
2391371946

119679526 *Exceſs*

B's Part is 1344 Pounds, and .34542079 *Decimals.*

C's Part. *l.* *deci.* *l. deci:* *l.* *deci:*
If 2657.07994) 3254.7—*qt.*1074.23914

1074.23914
3254.7

751967398
429695656
537119570
214847828
322271742

l. *deci.*
2657.07994)3496326.128958(1315.8490553
265707994

839246188
797123982

42122206

421222069
265707994
1555140755
1328539970
2266007858
2135663952
1303439060
1062831976
2406070840
2391371946
1469889400
1328539970
1413494300
1328539970
849543300
797123982
524193180
531415988
7222808 *Exceſs.*

l. *deci.*
A's Share is —— 594.5017604
B's Share is ——1344.34542079
C's Share is ——1315.84905532
Total Shares — 3254.69623651

II. Example.

Queſt. *A. B. C.* Theſe 3 Perſons gave in the *Stocks* following, for trading together for a certain Time, as follows, *viz.* *A.* gave 98 Pounds for 6 Years: *B.* gave 49 Pounds for 8 Years, and *C.* gave 78 Pounds, 8 Shillings, or .4 *Decimals*, for 9 Years. And upon theſe *Stocks*, and in that Time they gained 4324 Pounds, 12 Shillings, or .6 *Decimals*. I demand their *Shares* thereof, according to *Stock* and *Time*. Thus,

	l. *y.*		*l.* *y.*		*l. dec.* *y.*
	A. 98—6		*B.* 49—8		C. 78.4—9
	6		8		9
Total	588	Tot.	392	Tot.	7056

A's Total is — 588
B's Total is — 392
C's Total is — 7056
Their Total — 8036 for a common *Diviſor*.

III. Example.

Queſt. Theſe two Perſons went to trade together for ſome Time, *viz.* *A.* for 4 Years, 2 Months, or .1667 *Decimals*, and gave in for *Stock* 58 Pounds, 5 Shillings, or .25 *Decimals*; and *B.* gave for 6 Years 93 Pounds: And upon trading, they found themſelves to have gained 973 Pounds, 9 Shillings, 6 Pennies, or .4750 *Decimals*. I demand their Share? Thus.

A. 58.25—4.1667	*B.* 93—6
4.1667	6
	Total 558

Nota, Perform theſe, as you ſee the firſt Example done, obſerving the *Caſes* before mentioned.

Alligation MEDIAL in DECIMALS.

THis **Rule** of *Decimals* is to be performed the ſame Way as the *Vulgar*; only conſider the *Caſes* before mentioned, as they occur. For a Trial thereof, I give you an Example fully performed.

I. Example.

Queſt. A certain Merchant having various *Kinds* of *Goods* by him, at various *Prices*, and being to give up his Shop, he deſires to know what he may ſell them at overhead (bad with the good) to the Merchant, to take his Shop and Goods off his Hand, *viz.* 14 Pounds of *Currans*, at 5 Shillings, or .25 *Decimals per* Pound, 18 Pounds of *Sugar Candy*, at 14 Shillings, or .7 *Decimals per* Pound, 28 Pounds of *Candy Broad*, at 10 Shillings, or .5 *Decimals per* Pound, 12 Pounds of *Prunes*, at 5 Shillings, or .25 *Decimals per* Pound, and 19 Pounds of *Rice*, at 13 Shillings, or .65 *Decimals per* Pound? See the Work:

	l.	*deci.*	*l. d.*
Currans —	14,	at .25 *per* Pound, is —	3.50
Sugar Candy	18,	at .7 *per* Pound, is —	12.6
Candy Broad,	28,	at .5 *per* Pound, is —	14.0
Prunes ——	12,	at .25 *per* Pound, is —	3.0
Rice ——	19,	at .65 *per* Pound, is —	12.35
Simp. Total	91 Pounds,	***Total Price*** —	45.45

Then ſay, by the *Rule of Three direct*,

l. *l. deci.* *l.*
If 91 — 45.45 — *qt.* 1
1 *deci.*

91) 45.45 (.49945055
364
905
819
860
819
410
364
460
455
500
455
450
455
5 *Exceſs.*

Anſ. He muſt bargain to ſell them at .49945055 *Decimals per* Pound overhead.

Nota, To prove your Work above, ſay thus,

l. *decimals,* *l.*
If 1 —— .49945055 — *qt.* 91
91
49945055
449505495
l. 45.45000005
20
s. 900000100

II. Ex-

II. Example.

Queſt. A Farmer having theſe *Quantities* and *Qualities* by him of *Victual*, deſires to know how he may ſell them overhead *per* Boll.

l. deci.
Oats —— 32, at 6 Pounds *per* Boll, is 192.0
Barley — 28, at 8 Pounds *per* Boll, is 224.0
Rye —— 12, at 4 *l.* 4 *s.* or .2 *deci.* is 50.4
Wheat — 18, at 9 Pounds *per* Boll, is 162.0
Simples — 90 *Total Price* 628.4

Bolls, *l. deci.* *Bolls.*
If 90 —— 628.4 — *qt.* 1

Nota, As this Example is tabled to you, and the other wrought, ſo perform the reſt of the *Queries* belonging to this *Rule* in the *Vulgar*, or any others properly belonging thereto.

Now *Alligation Alternate* I paſs by in the *Decimal Part*, becauſe it is not ſo very neceſſary, being fully explained in the *Vulgar*.

Menſuration of Squares in Decimals.

THis *Rule* may be performed more eaſily than the *Vulgar*, if *Fractions* occur, and *Caſes* before directed be conſidered.

I. Example:

Queſt. Tell me the *ſquare Ells* in theſe 3 *Rooms* that were plaiſtered by the Workman, whoſe Wages being 6 Shillings, or .3 *Decimals* for each *ſquare Ell* therein contained, *viz.* firſt *Room* being in *Length* 12 *Ells*, and *Breadth* 8 *Ells*. The ſecond being 18 *Ells Length*, and 12 *Ells Breadth*. The third *Room* being 12 *Ells Length*, and 6 *Ells Breadth*, and 3 *Quarters*, or .75 *Decimals*? See the Work.

1ſt *Room*,	2d *Room*,	3d *Room*,
L. 12	*L.* 18	*L.* 12
B. 8	*B.* 12	*B.* 6.75
Ells 96 *Square*,	36	60
	18	84
	Ells 216	72
		Ells 81.00 *d.*

Then place it thus,

Ells ſquare,

1ſt *Room*'s Product is —— 96
2d *Room*'s Product is —— 216
3d *Room*'s Product is —— 81.00
Total *ſquare Ells* —— 393.00
Price of each — .3 *deci.*
Total Price 117.900

Anſ. 393 *Ells ſquare* will coſt you 117 Pounds, or *Integers*, and .9 *Decimals*, or 18 Shillings.

Nota, As this it performed, ſo do all others properly belonging to this *Rule*, where *Fractions* are mixt with *Integers*.

II. Example.

Queſt. Tell me the *ſquare Feet* in that *Pavement*, whoſe *Length* is 42 *Feet*, 3 *Inches*, or .25 *Decimals*,

Decimals, and *Breadth* 26 *Feet*, 4 *Inches*, or .3334 *Decimals*. The *Price* agreed for each *Square Foot* being 8 *Shillings*, or .4 *Decimals*?

Feet, deci.
L. 42.25
B. 26.3334

Perform it as before, and multiply its *Total* by the *Price* promiſed.

III. Example.

Queſt. Tell me the *ſquare Feet* in that Hinging, whoſe *Length* is 12 *Feet*, 4 *Insbes*, or .3334 *Decimals*; and *Breadth* 8 *Feet*, 6 *Inches*, or .5 *Decimals*: The *Merchant* demanding for each *ſquare Foot* therein 12 *Shillings*, or .6 *Decimals*?

Feet, deci.
L. 12.3334
B. 8.5 *Decimals.*

Menſuration of Solids in DECIMALS.

PErform this *Rule* as directed in the *Vulgar.*

I. Example.

Queſt. There is a Piece of *Wood*, whoſe *Length* is 6 *Feet*, *Breadth* 4 *Feet*, *Thickneſs* 5 *Feet*. I demand the *ſolid Feet* therein, and *Price*, at the Rate of 6 *Shillings*, or .3 *Decimals* for each *ſolid Foot* therein?

Feet,
L. 6
B. 4
24
Thick. 5
120 *Feet ſolid,*
Price .3 *Decimals.*
Pounds 36.0 *deci.*

Anſ. Therein there are 120 *ſolid Feet*, and the *Price* therefore is 36 *Pounds*, .0 *Decimals.*

II. Example.

Queſt. There is a *Stone* of 12 *Feet*, 8 *Inches*, or .6667 *Decimals* long, 8 *Feet*, 3 *Inches*, or .25 *Decimals* broad, and 6 *Feet*, 2 *Inches*, or .1667 *Decimals* thick. I demand the *ſolid Feet* therein, and what the *Maſon* muſt have for his Work, at the Rate of 11 Shillings, or .55 *Decimals per ſolid* Foot?

Feet, deci.
Length, 12.6667
Breadth, 8.25
633335
253334
1013336
104.500275
Thick. 6.1667

So proceed with this Example, as above directed.

Rule

Rule of FALSHOOD in DECIMALS.

THis *Rule* you may perform as you did the *Vulgar*; but take ſpecial Care to the directed *Caſes* as they occur.

Take care to ſind out your *falſe Proportions*, and their *real Shares* and *Proportions* will be the more eaſily found out.

I. Example.

Queſt. You are hereby deſired to divide 100 *Pounds* or *Integers*, amongſt theſe 4 Perſons, *viz.* *A.* *B.* C. and *D.* whereof *A.* is to have a third Part, *B.* a fourth Part, C. a fifth Part, and *D.* a ſixth Part thereof. Now I demand their *Shares* therein, according to their Ranking?

The Work will ſtand thus.

```
A's  l. deci.       B's  l.          C's    l.
3d)100(33.3334   4th)100 (25.    5th)100(20
   9                 8                10(
  ---              ----              ----
   10                20                0
    9                20         D's
   ---              ---         l.
    10               ..    6th)100  (16.6667
     9                         6
    ---                      -----
     10                       40
      9                       26
     ---                      -----
      10                       40
       9                       36
      ---                      -----
       10                       40
       12                       36
      ---                      -----
        2 Exceſs
```

40
36
40
42
2 *Exc.*

Table it thus, *l.*
A's Falſe *Share* is — 33.3334
B's Falſe *Share* is — 25. . . . .
C's Falſe *Share* is — 20. . . . .
D's Falſe *Share* is — 16.6667
Total Falſe *Shares* 95.0001 *Exceſs.*

Then ſay,
l. *l. deci.* *l.*
A's If 95. — 33.3334 — *qt.* 100
100

95.)33.333400 (35.08779
285
483
475
834
760
740
665
750
665
850
855
.5 *Exceſs.*
l. deci.

A's Part is — 35.08779

B's If

l. *l.* *l.*
B's If 95. — 25: — *qt.* 100
100 *l. deci.*
95.) 2500 (26.31579
190
600
570
300
285
150
95
550
475
750
665
850
855
l. deci. 5 *Exceſs*

B's Part is 26.31579

l. *l.* *l.*
C's If 95. — 20. *qt.* 100
100 *l. deci.*
95) 2000 (21.052632
190
100
95
500
475
250
190

600
570
300
285
150
190
l. deci. 40 *Excess.*
C's Part is 21.052632
l: l. deci. l.
D's If 95 —— 16.6667 — *qt.* 100
100 *l. deci.*
95) 1666.6700 (17.5439
95
716 *D's* Part is 17.5439
665
516
475
417
280
370
285
850
855
5 *Excess. l. deci.*

Having found out their real *Shares*, place them down as below. *l. deci.*

A's real Share thereof will be 35.08779
B's real Share thereof will be 26.31579
C's real Share thereof will be 21.052632
D's real Share thereof will be 17.5439
Total of their Shares is 100 000112 *Ex.*

Nota, As you ſee this preceeding Example done, ſo do in theſe following, and all others like them, in order to find their real *Proportions* and *Shares.*

II. Example.

Queſt. There is 575 *Pounds* or *Integers* to be divided amongſt theſe *Perſons*, viz. *A.* a third *Part* thereof, *B.* a fourth *Part*, *C.* a ſixth *Part*, and *D.* an eighth *Part* thereof. Now demand their *real Shares* therein? Do therein as before exemplified.

III. Example.

Queſt. You are deſired to divide 3000 *Pounds* or *Integers* amongſt 3 *Perſons*, viz. *D.* a fifth *Part* thereof, B. a ſixth *Part*, and *G.* an eighth *Part.* Now I demand their *juſt Share* thereof, according to their *Proportion* and *Part* claimed therein? Do in this as before.

Rule of PRACTICE in DECIMALS.

DO in this *Rule*, as in the *Vulgar*; only conſider to perform aright where *Integers* and *Decimals* occur, according to their various *Caſes.*

Nota, I ſhall only mention an Example or two, to pave the Way for other *Operations*, becauſe it may more eaſily be performed by the *Vulgar*, upon Account of the Multiplicity of *decimal Figures* occuring (in its *Operations*) for the *vulgar Fractions*.

	Decimals,	
Price	.05	32 *Pounds* of *Shalk*, at 1 *Shilling*, or
		.05 .05 *Decimals per* Pound.
	l.	1.60
		20
	s.	12.00 *Facit*, in *Anſ.* 1 *l.* 12 *s.* or 1.60 *dec.*
	deci.	
	.1	432 *Pounds* of *Barley*, at 2 *Shillings*,
		.1 or .1 *Decimal* per *Pound*.
		l. 43.2
		20 *Facit*, in *Anſ.* 43 *Pounds*, 4
		s. 4.0 *Shillings*, or .2 *Decimals*.

FINIS.

Now follow the *Tables of Intereſt*, from one Shilling *Scots* or *Sterling*, to 100000 *Pounds per annum*, correctly done.

INTEREST at 4 *per Cent. per annum.*

s.	l.	s.	d.	qrs.	*fract.*	*lib.*	*lib.*
1				1	1840	100	04
2				3	1680	200	08
3			01	1	1520	300	12
4			01	3	1360	400	16
5			02	1	1200	500	20
6			02	3	1040	600	24
7			03	1	880	700	28
8			03	3	720	800	32
9			04	1	560	900	36
10			04	3	400	1000	40
l.						2000	80
1			09	2	40	3000	120
2		01	07		80	4000	160
3		02	04	3	20	5000	200
4		03	02	1	60	6000	240
5		04				7000	280
6		04	09	2	40	8000	320
7		05	07		80	9000	360
8		06	04	3	20	10000	400
9		07	02	1	60	20000	800
10		08				30000	1200
20		16				40000	1600
30	01	04				50000	2000
40	01	12				60000	2400
50	02					70000	2800
60	02	08				80000	3200
70	02	16				90000	3600
80	03	04				100000	4000
90	03	12					

EXPLICATION.

To find the *Intereſt* of any *Sum* for one Year at 4 *per Cent. per annum*, obſerve this Method, ſeek the Column upon your left Hand of either of theſe *Pillars*, and oppoſite to the *Shillings* or *Pounds* you want to know the Intereſt of for a Year, you will find the ſame either in *Pounds*, *Shillings*, *Pennies*, *Farthings* or *Fractions*. As Example, I want to know the Intereſt of 445 Pounds, 14 Shillings for a Year, at 4 Pounds *per Cent. per annum*. Now in this Table of 4 *per Cent*, ſeek for 400 Pounds, and finding it, I ſee its Intereſt for a Year to amount to 16 Pounds: Then ſeek for Column where 40 Pounds is, and oppoſite to it you will find 1 *Pound*, 12 *Shillings*: Then ſeek for 5 *Pounds*, and oppoſite to it you will find 4 *Shillings*. Then purſue for 14 *Shillings*, and in ſeeking it, firſt ſeek for 10 *Shillings*, and oppoſite to it you will find 4 *Pennies*, 3 *Farthings*, and a *Fraction* of 400. Then ſeek for 4 *Shillings*, and oppoſite to it you will find 1 *Penny*, 3 *Farthings*, and a *Fraction* of 1360. All being added, as below, will amount to (of Intereſt for a Year) 17 *Pounds*, 16 *Shillings*, 06 *Pennies*, 2 *Farthings*, and *Fraction* 1760 of 2000.

Lib.	*l.*	*s.*	*d.*	*qrs.*	*fract.*
400 is of *Intereſt*	16	—	—	—	
40 is of *Intereſt*	1	12	—	—	
5 is :	0	04	—	—	
445 is : : :	17	16	—	—	Fract.
10 *Shill.* of *Intereſt*	0	00	04	3.400	
4 *Shill.* of *Intereſt*	0	60	01	3.1360	
Total *Intereſt*	17	16	06	2.1760	

If for more Years than one, you muſt multiply that Intereſt for a Year, by theſe Years you want it for.

Nota, As you perform for Intereſt of Money in this Table of 4 *per Cent.* ſo in all the other Tables purſue for the ſame, according to its various Intereſts, conſtitute by Act of Parliament.

Intereſt at 4 and ½ *per Cent. per annum.*

s.	l.	s.	d.	qrs.	fract.	lib.	l.	s.
1				2	320	100	4	10
2			01		640	200	9	
3			01	2	960	300	13	10
4			02		1280	400	18	
5			02	2	1600	500	22	10
6			03		1920	600	27	
7			03	3	240	700	31	10
8			04	1	560	800	36	
9			04	3	880	900	40	10
10			05	1	1200	1000	45	
l.						2000	90	
1			10	3	20	3000	135	
2		01	09	2	40	4000	180	
3		02	08	1	60	5000	225	
4		03	07		80	6000	270	
5		04	06			7000	315	
6		05	04	3	20	8000	360	
7		06	03	2	40	9000	405	
8		07	02	1	60	10000	450	
9		08	01		80	20000	900	
10		09				30000	1350	
20		18				40000	1800	
30	01	07				50000	2250	
40	01	16				60000	2700	
50	02	05				70000	3150	
60	02	14				80000	3600	
70	03	03				90000	4050	
80	03	12				100000	4500	
90	04	01						

Intereſt at 5 *per Cent. per annum.*

s.	l.	s.	d.	qrs.	fract.	lib.	l.
1				2	800	100	5
2			01		1600	200	10
3			01	3	400	300	15
4			02	1	1200	400	20
5			03			500	25
6			03	2	800	600	30
7			04		1600	700	35
8			04	3	400	800	40
9			05	1	1200	900	45
10			6			1000	50
l.						2000	100
1		01				3000	150
2		02				4000	200
3		03				5000	250
4		04				6000	300
5		05				7000	350
6		06				8000	400
7		07				9000	450
8		08				10000	500
9		9				20000	1000
10		10				30000	1500
20	01					40000	2000
30	01	10				50000	2500
40	02					60000	3000
50	02	10				70000	3500
60	03					80000	4000
70	03	10				90000	4500
80	04					100000	5000
90	04	10					

Intereſt at 5 and ½ *per Cent. per annum.*

s.	l.	s.	d.	qrs	fract.	lib.	lib.	s.
1				2	1280	100	5	10
2			01	1	560	200	11	
3			01	3	1840	300	16	10
4			02	2	1120	400	22	
5			03	1	400	500	27	10
6			03	3	1680	600	33	
7			04	2	960	700	38	10
8			05	1	240	800	44	
9			05	3	1520	900	49	10
10			06	2	800	1000	55	
l.						2000	110	
1		01	01		80	3000	165	
2		02	02	1	60	4000	220	
3		03	03	2	40	5000	275	
4		04	04	3	20	6000	330	
5		05	06			7000	385	
6		06	07		80	8000	440	
7		7	8	1	60	9000	495	
8		8	9	2	40	10000	550	
9		9	10	3	20	20000	1100	
10		11				30000	1650	
20	1	02				40000	2200	
30	1	13				50000	2750	
40	2	04				60000	3300	
50	2	15				70000	3850	
60	3	06				80000	4400	
70	3	17				90000	4950	
80	4	08				100000	5500	
90	4	19						

Intereſt at 6 *per* Cent. *per annum.*

s.	*l.*	*s.*	*d.*	*qrs.*	*fract.*	*lib.*	*lib.*
1				2	1760	100	6
2			01	1	1520	200	12
3			02		1280	300	18
4			02	3	1040	400	24
5			03	2	800	500	30
6			04	1	560	600	36
7			05		320	700	42
8			05	3	80	800	48
9			06	1	1840	900	54
10			07		1600	1000	60
l.						2000	120
1		01	02	1	60	3000	180
2		02	04	3	20	4000	240
3		03	07		80	5000	300
4		04	09	2	40	6000	360
5		06				7000	420
6		07	02	1	60	8000	480
7		08	04	3	20	9000	540
8		09	07		80	10000	600
9		10	09	2	40	20000	1200
10		12				30000	1800
20	01	04				40000	2400
30	01	16				50000	3000
40	02	08				60000	3600
50	03					70000	4200
60	03	12				80000	4800
70	04	04				90000	5400
80	04	16				100000	6000
90	05	08					

Intereſt at 7 per Cent. per annum.

s.	*l.*	*s.*	*d.*	*qrs.*	*fract.*	*lib.*	*lib.*
1				3	720	100	7
2			01	2	1440	200	14
3			02	2	160	300	21
4			03	1	880	400	28
5			04		1600	500	35
6			05		320	600	42
7			05	3	1040	700	49
8			06	2	1760	800	56
9			07	2	480	900	63
10			08	1	1200	1000	70
l.						2000	140
1		01	04	3	20	3000	210
2		02	09	2	40	4000	280
3		04	02	1	60	5000	350
4		05	07		80	6000	420
5		07				7000	490
6		08	04	3	20	8000	560
7		09	09	2	40	9000	630
8		11	02	1	60	10000	700
9		12	07		80	20000	1400
10		14				30000	2100
20	01	08				40000	2800
30	02	02				50000	3500
40	02	16				60000	4200
50	03	10				70000	4900
60	04	04				80000	5600
70	04	18				90000	6300
80	05	12				100000	7000
90	06	06					

Intereſt

Intereſt at 8 *per Cent. per annum.*

s.	l.	s.	d.	qrs	*fract.*	*lib.*	*lib.*
1				3	1680	100	8
2			01	3	1360	200	16
3			02	3	1040	300	24
4			03	3	720	400	32
5			04	3	400	500	40
6			05	3	80	600	48
7			06	2	1760	700	56
8			07	2	1440	800	64
9			08	2	1120	900	72
10			09	2	800	1000	80
l.						2000	160
1		01	07		80	3000	240
2		03	02	1	60	4000	320
3		04	09	2	40	5000	400
4		06	04	3	20	6000	480
5		08				7000	560
6		09	07		80	8000	640
7		11	02	1	60	9000	720
8		12	09	2	40	10000	800
9		14	04	3	20	20000	1600
10		16				30000	2400
20	1	12				40000	3200
30	2	08				50000	4000
40	3	04				60000	4800
50	4					70000	5600
60	4	16				80000	6400
70	5	12				90000	7200
80	6	08				100000	8000
90	7	04					

Various *Simples* at 2, 4, 6, 8, 10 *d.*

2 *d.*	s.	*d.*
1		02
2		04
3		06
4		08
5		10
6	01	
7	01	02
8	01	04
9	01	06
10	01	08
20	03	04
30	05	
40	06	08
50	08	04
60	10	
70	11	08
80	13	04
90	15	
100	16	08

4 *d.*	*s.*	*d.*
1		04
2		08
3	01	
4	01	04
5	01	08
6	02	
7	02	04
8	02	08
9	03	

10	03	04	
20	06	08	
30		10	
40		13	04
50		16	08
60	01		
70	01	03	04
80	01	06	08
90	01	10	
100	01	13	04

6 *d.*	*l.*	*s.*	*d.*
1			06
2		01	
3		01	06
4		02	
5		02	06
6		03	
7		03	06
8		04	
9		04	06
10		05	
20		10	
30		15	
40	01		
50	01	05	
60	01	10	
70	01	15	
80	02		
90	02	05	
100	02	10	

8 *d.*	*l.*	*s.*	*d.*
1			08
2		01	04
3		02	
4		02	08
5		03	04
6		04	
7		04	08
8		05	04
9		06	
10		06	08
20		13	04
30	01		
40	01	06	08
50	01	13	04
60	02		
70	02	06	08
80	02	13	04
90	03		
100	03	06	08

10*d*	*l.*	*s.*	*d.*
1			10
2		01	08
3		02	06
4		03	04
5		04	02
6		05	
7		05	10
8		06	08
9		07	06

Various

Various *Simples* at 1, 2, 3, 4 *s. per Piece.*

10*d*	*l.*	*s.*	*d.*
10		08	04
20		16	08
30	01	05	
40	01	13	04
50	02	01	08
60	02	10	
70	02	18	04
80	03	06	08
90	03	15	
100	04	03	04

1 *s.*	*l.*	*s.*
1		01
2		02
3		03
4		04
5		05
6		06
7		07
8		08
9		09
10		10
20	01	
30	01	10
40	02	
50	02	10
60	03	
70	03	10
80	04	
90	04	10
100	05	

2 *s.*	*l.*	*s.*
1		02
2		04
3		06
4		08
5		10
6		12
7		14
8		16
9		18
10	1	
20	2	
30	3	
40	4	
50	5	
60	6	
70	7	
80	8	
90	9	
100	10	

3 *s.*	*l.*	*s.*
1		03
2		06
3		09
4		12
5		15
6		18
7	01	01
8	01	04
9	01	07
10	01	10
20	03	
30	04	10
40	06	
50	07	10
60	09	
70	10	10
80	12	
90	13	10
100	15	

4 *s.*	*l.*	*s.*
1		04
2		08
3		12
4		16
5	01	
6	01	04
7	01	08
8	01	12
9	01	16
10	02	
20	04	
30	06	
40	08	
50	10	
60	12	
70	14	
80	16	
90	18	
100	20	

Various *Simples* at 5, 6, 7, 8, 9 *s. per Piece.*

at 5 *s*	*l.*	*s.*
1		05
2		10
3		15
4	01	
5	01	05
6	01	10
7	01	15
8	02	
9	02	05
10	02	10
20	05	
30	07	10
40	10	
50	12	10
60	15	
70	17	10
80	20	
90	22	10
100	25	

at 6 *s*	*l.*	*s.*
1		06
2		12
3		18
4	01	04
5	01	10
6	01	16
7	02	02
8	02	08
9	02	14
10	03	
20	06	
30	09	
40	12	
50	15	
60	18	
70	21	
80	24	
90	27	
100	30	

at 7 *s*	*l.*	*s.*
1		07
2		14
3	01	01
4	01	08
5	01	15
6	02	02
7	02	09
8	02	16
9	03	03
10	03	10
20	07	
30	10	10
40	14	
50	17	10
60	21	
70	24	10
80	28	
90	31	10
100	35	

at 8 *s*	*l.*	*s.*
1		08
2		16
3	01	04
4	01	12
5	02	
6	02	08
7	02	16
8	03	04
9	03	12
10	04	
20	08	
30	12	
40	16	
50	20	
60	24	
70	28	
80	32	
90	36	
100	40	

at 9 *s*	*l.*	*s.*
1		09
2		18
3	01	07
4	01	16
5	02	05
6	02	14
7	03	03
8	03	12
9	04	01

Various *Simples* at 10 s. and 1, 2, 3 l.

at 9 s.	l.	s.	at 1 l.	l.	l.	l.
10	04	10	1	01	20	40
20	09		2	02	30	60
30	13	10	3	03	40	80
40	18		4	04	50	100
50	22	10	5	05	60	120
60	27		6	06	70	140
70	31	10	7	07	80	160
80	36		8	08	90	180
90	40	10	9	09	100	200
100	45		10	10	at 3 l.	l.
at 10 s	l.	s.	20	20	1	03
1		10	30	30	2	06
2	01		40	40	3	09
3	01	10	50	50	4	12
4	02		60	60	5	15
5	02	10	70	70	6	18
6	03		80	80	7	21
7	03	10	90	90	8	24
8	04		100	100	9	27
9	04	10	at 2 l.	l.	10	30
10	05		1	02	20	60
20	10		2	04	30	90
30	15		3	06	40	120
40	20		4	08	50	150
50	25		5	10	60	180
60	30		6	12	70	210
70	35		7	14	80	240
80	40		8	16	90	270
90	45		9	18	100	300
100	50		10	20		

Various *Simples* at 4, 5, 6, 7, 8 *libs.*

at 4 *l.*	*l.*	10	50	at 7 *l.*	*l.*
1	04	20	100	1	07
2	08	30	150	2	14
3	12	40	200	3	21
4	16	50	250	4	28
5	20	60	300	5	35
6	24	70	350	6	42
7	28	80	400	7	49
8	32	90	450	8	56
9	36	100	500	9	63
10	40	at 6 *l.*	*l.*	10	70
20	80	1	06	20	140
30	120	2	12	30	210
40	160	3	18	40	280
50	200	4	24	50	350
60	240	5	30	60	420
70	280	6	36	70	490
80	320	7	42	80	560
90	360	8	48	90	630
100	400	9	54	100	700
at 5 *l.*	*l.*	10	60	at 8 *l.*	*l.*
1	05	20	120	1	08
2	10	30	180	2	16
3	15	40	240	3	24
4	29	50	300	4	32
5	25	60	360	5	40
6	30	70	420	6	48
7	35	80	480	7	56
8	40	90	540	8	64
9	45	100	600	9	72

Various *Simples* at 9, 10, 20, 30, 40, 50 *libs.*

8 *l.*	*l.*	10*l.*	*l.*	*l.*	*l.*	40*l.*	*l.*
10	80	1	10	20	400	1	40
20	160	2	20	30	600	2	80
30	240	3	30	40	800	3	120
40	320	4	40	50	1000	4	160
50	400	5	50	60	1200	5	200
60	480	6	60	70	1400	6	240
70	560	7	70	80	1600	7	280
80	640	8	80	90	1800	8	320
90	720	9	90	100	2000	9	360
100	800	10	100	30*l.*	*l.*	10	400
9 *l.*	*l.*	20	200	1	30	20	800
1	9	30	300	2	60	30	1200
2	18	40	400	3	90	40	1600
3	27	50	500	4	120	50	2000
4	36	60	600	5	150	60	2400
5	45	70	700	6	180	70	2800
6	54	80	800	7	210	80	3200
7	63	90	900	8	240	90	3600
8	72	100	1000	9	270	100	4000
9	81	20*l.*	*l.*	10	300	50*l.*	*l.*
10	90	1	20	20	600	1	50
20	180	2	40	30	900	2	100
30	270	3	60	40	1200	3	150
40	360	4	80	50	1500	4	200
50	450	5	100	60	1800	5	250
60	540	6	120	70	2100	6	300
70	630	7	140	80	2400	7	350
80	720	8	160	90	2700	8	400
90	810	9	180	100	3000	9	450
100	900	10	200				

10	500
20	1000
30	1500
40	2000
50	2500
60	3000
70	3500
80	4000
90	4500
100	5000

Explication of theſe preceeding TABLES.

Queſt. I demaud the Price of 63 Ells of Linning at 1 Pound, 14 Shillings *per* Ell?

1*mo.* Seek for the left Hand Column of *Simples* at 1 Pound *per Simple,* then oppoſite to 60 thereof you will find 60 Pounds. Then oppoſite to 3 *Simples* at the ſame Price you will find 3 Pounds; which in all, of Pounds *per* Ell, will be 63. Then,

2*do.* Seek for left Hand Column of *Simples* at 10 *ſhil. per Simple,* and oppoſite to 60 thereof you will find 30 *libs.* for the Price of 60 *Simples.* Then oppoſite to 3 *Simples* at that ſame Price, you will find 1 *lib.* 10 *ſhil.* which being added, will amount to 31 *libs.* 10 *ſhil.* Then,

3*tio.* Seek for left Hand Column of *Simples* at 4 *ſhil. per Simple,* and oppoſite to 60 *Simples* you will find 12 *lib.* Then oppoſite to the 3 odd *Simples* at that ſame Price you will find 12 *ſhil.* which in all make up 12 *libs.* 12 *ſhil.*

Having found out their *Price,* place them thus,

	l.		*s.*	*d*
1ſt Article	63	:	00	—
2d Article	31	:	10	—
4d Article	12	:	12	—
Total *Price*	107	:	02	—

for the 63 Ells at 1 *l.* 14 *s. per* Ell. As with theſe, ſo with others.

Nota, I am obliged to paſs by the *Logarithms*, *Signs* and *Tangents* in this Piece, for want of Figures to perform the ſame; but you may expect them in our next Edition.

A ſhort and methodical Direction, for finding out the GOLDEN NUMBER and EPACT any Year.

TO find out the *Golden Number* any Year, follow this Method, *viz.* Add one to the Year of God you want to know it in: After you have added that one to the Year, divide its *Total* by 19, and the *Remainder* will be the *Golden Number* ſought, for that Year.

Example.

Queſt. I demand the *Golden Number* for the Year 1724. Thus.

Preſent Year ſought is, 1724.
To which add the one 1
Divide by 19) 1725 (9
171
Golden Number 15 for that *Year.*

Anſ. Your *Golden Number* for Year 1724, will be 15.

To find out the *Epact* hereby, follow this Method, *viz.* Multiply the *Golden Number* ſo found out by 11, and the *Product* thereof divide by 30 (the Days of the Moon) and the *Remainder* will be the *Epact* that Year.

Example.

Queſt. I demand the *Epact* (by this Method) for 1724, the *Golden Number* being 15.

Take 15, and
multiply it by 11
15
15

The *Product* will be 165, which *Product* 165 divide (as before directed) by 30. See the Work.

3·0) 165 (5
15

Anſ. The *Epact* is .15 for Year 1724.

Nota, After you have found out the *Epact* for one Year, you may ſo find it out for many Years, by adding 11 each Year, till you come to 30 the Days of the *Moon*, and what is over 30, will be the *Epact* for that Year. As Example, Add 11 to the *Epact* 1724, being 15, will make 26 for an *Epact*, Year 1725. Then to that Year's *Epact* add 11, being added, will amount to 37, which is 7 above 30, for an *Epact* Year 1726. And ſo on with other Years, as theſe are done.

Direction.

For finding out the Age of the *Moon* at any Time, follow this Method, *viz.* Add to the *Epact*, that Year you want to know it in, the Day, or Days of that Month, as alſo the Number of the Months from *March incluſive* : And if the *Total* thereof be leſs than 30, it will be the *Moon's* Age, if more than 30, it will be the *Moon's* Age, caſting away 30 therefrom. As Example.

Queſt. I demand the Age of the *Moon* (by this preceeding Method) the 16th of *June* 1724? Thus.

The *Epact* 1724 — is — 15
The 16th of *June* is — 16 Days
Months ſince *March* are 4
35
ſubſtract 30 therefrom
The Age of the *Moon* then will be 5 Days.

Anſ. The Age of the *Moon* upon the 16th of *June* 1724, will be 5 Days. Now, as with this Example, ſo with all others, according as you want to know them.

Having this far made you to underſtand how to know your *Golden Number*, *Epact*, and Age of the *Moon*, I next proceed to give you a *Table* to know your *ſailing Hours* of *Tide* at *Leith*, and it is as follows.

TABLE.

Moons Age,		*full Sea.*	
incr.	*decr.*		
days	*days*	*hours*	*minuts*
1	16	2	20
2	17	3	08
3	18	3	56
4	19	4	44
5	20	5	32
6	21	6	20
7	22	7	08
8	23	7	56
9	24	8	44
10	25	9	32
11	26	10	20
12	27	11	08
13	28	11	56
14	29	12	44
15	30	1	32

Explication of this TABLE.

I demand full *Sea* the 16th of *June* 1724.

Anſ. The *Moon's* Age that Day (by the foregoing Example) is found to be 5 Days: So that from this *Table* I find oppoſite to the 5 Days (the Age of the *Moon*) that it will be full *Sea* at *Leith* 32 Minutes paſt 5 Hours in the Morning. Now as with this, ſo with all others, according to the Age of the *Moon*, either as to her *Increaſe* or *Decr.*

Direction.

To know the *Leap Year* any Year it may fall out in, which is certainly once in the 4 Years, for each Year hath 6 Hours more than the natural Days therein, and therefore theſe 6 Hours in four Years make up one natural Day; which Day that Year is added to *February* (becauſe it is leaſt) to make it 29 Days, being otherwiſe but 28. Now to know what Year this *Leap* may fall out in, take this Method, *viz.*

viz. divide your Year by 4, and the Year in which a *Cypher* remains will be your *Leap Year.* If 0. do not remain, then the Remains will be ſo many Years paſt *Leap*, one Year in Advance towards another.

Queſt. I demand the *Leap Year* after 1724? Thus. See the Work.

```
4) 1724 (431              4) 1725 (431
   16                        16
   ----                      ----
    12                        12
    12                        12
    ----                      ----
      4                         5
      4                         4
     ---                       ---
Leap  0     The firſt Year after 1 Leap.

4) 1726 (431              4) 1727 (431
   16                        16
   ----                      ----
    12                        12
    12                        12
    ----                      ----
      6                         7
      4                         4
     ---                       ---
      2d Year after Leap.       3d Year after L.

             4) 1728 (432
                16
                ----
                 12
                 12
                 ----
                   8
                   8
                  ---
                   0 or Leap Year.
```

Anſ. Leap Year will fall out after 1724, in Year 1728, as evident from the Work it ſelf. Now as with this Example, ſo with all others of this *Kind.* At the ſame Time I take the Opportunity to conclude my ſelf your devouted Friend and Servant to Power, and with all Thankfulneſs.

Soli DEO *gloria*;
Et
Amicis gratiæ.
valete.

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ERRATA.

PAge 191 in the *Queſtion*, inſtead of 5 *Pounds*, 10 *Shillings*, and 10 *Shillings*, or 5 *Decimals*. read only 5 *Pounds per Cent. per annum* ; alſo in the tabling of the *Operation*, inſtead of 5.5 *Decimals* in the third *Term*, read only 5 *Pounds* ; the *Operation* otherwiſe is right.

There are alſo ſome literal Eſcapes, but very few, which you may eaſily help as they occur, particularly, *Page* 194, *d* inſtead of *n*, in the Word *convenient*.

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